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AMIGA SHOPPER

The top-selling serious Amiga magazine

ISSUE 11 • MARCH 1992 • £1.25 • YOUR DEFINITIVE GUIDE

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Why the Harlequin graphics card gives you more than just 16 million colours...**page 22**

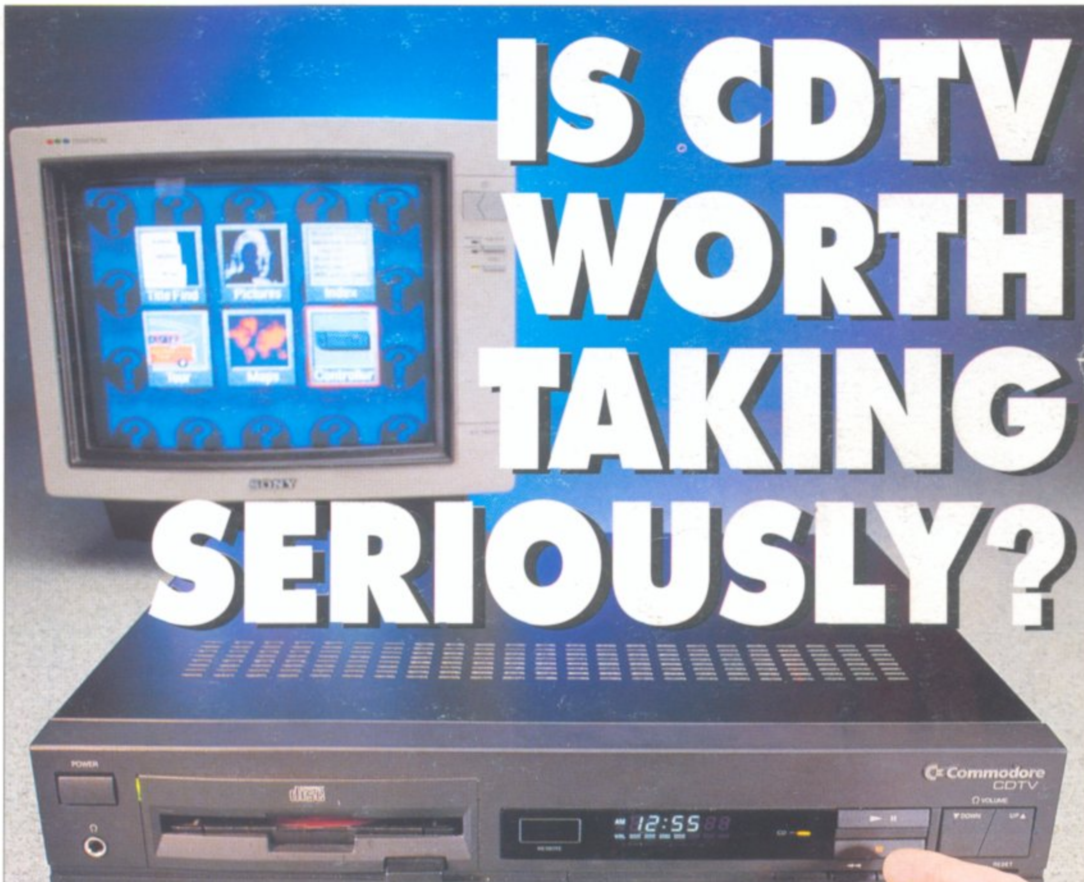
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IS CDTV WORTH TAKING SERIOUSLY?

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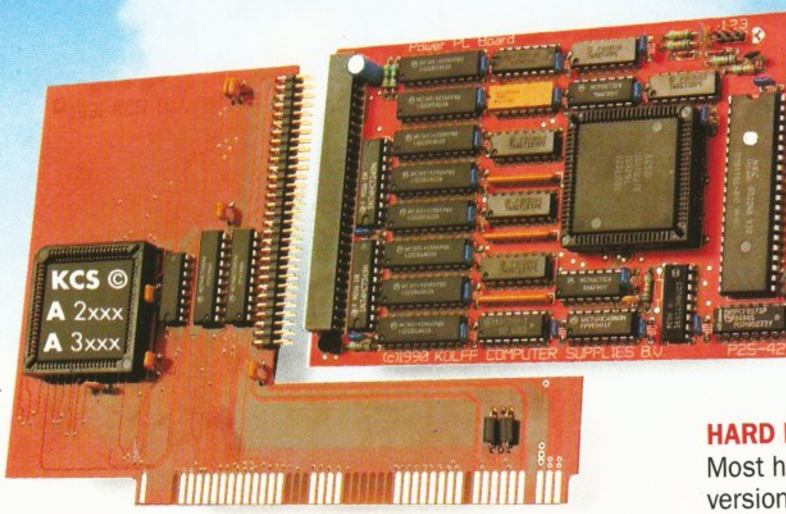
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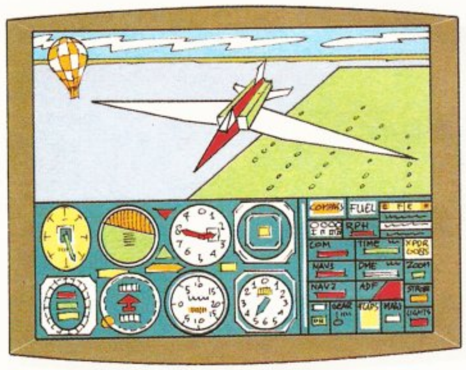
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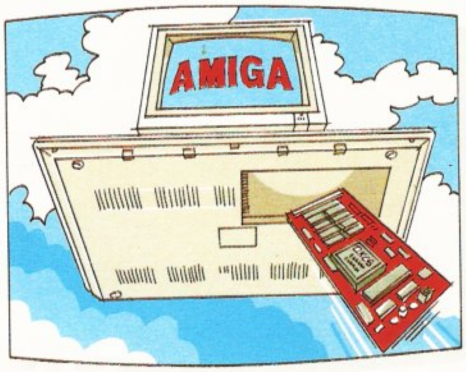
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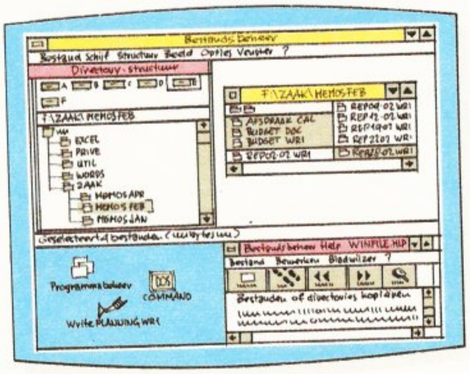


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WELCOME

This month we finally decided to take a good hard look at Commodore's Dynamic Total Vision – CDTV. One helluva name, of course, but is it really so visionary or does it just put the hype into hypermedia?

CDTV was designed as a machine to sit among the hi-fi rather than on the desktop; pitched firmly into the consumer electronics market. Commodore initially went to great lengths to literally distance the machine away from computers by insisting that CDTV should never be displayed next to them in high street stores. Because computers are, as we all know, horridly complex thingies which only boffins in anoraks buy, right? Not Mr Joseph Punter. No way. He has enough trouble with his video recorder.

But now the emphasis has changed. CDTV has recently been officially re-christened 'Amiga CDTV' and had £100 lopped off its price. Whether this is due to poor sales of CDTV or tremendous sales of the Amiga is hard to say. At any rate, CDTV is now officially what it was all along. A black box with an Amiga and CD-ROM drive inside, controlled by a neat infra-red hand-set.

Now, as far as software is concerned it's still early days. There's only a handful of titles that do justice to CDTV's capabilities. But what should we expect from future releases? After all, 650 Mb or so of storage on a single CD is probably just about enough space to fit every 'serious' piece of Amiga software ever released. Oh alright then, maybe two at the max. All that space alone should result in some useful disks in future – font catalogues, moving video clips and 24-bit image libraries just for starters. But it all rests on hardware sales to get the developers moving.

So let's hope the keyboards and disk-drives coming out for CDTV and the imminent A690 CD-ROM drive for the Amiga will sell in droves. Because interactive CD is the future.

Andy Storer

Editor

AMIGA SHOPPER AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 49; the many PD programs covered on page 154 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

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Are there any products or subjects you'd like us to take a look at? Well, just drop a line to:

***Amiga Shopper*,**
30, Monmouth Street,
Bath BA1 2BW.

PUBLIC DOMAIN WORLD

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month our new PD sampler Ian Wrigley scans through his latest batch to review:

- **Filesearch – a great err..file searching utility**
- **PowerSnap – a neat cut and paste screen grabber**
- **Term1.8A – a brilliant shareware comms program**
- **DirWorks – a powerful disk/file manager**
- **Plasma – a fast and furious fractal generator**

AND THAT'S NOT ALL!... JUST TURN TO PAGE 158

AMIGA ANSWERS

SIXTEEN PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. And for beginners our starter page will help you get to grips with your Amiga, and understand the other features in this month's issue.

We answer questions every month on Workbench • The CLI • Comms • Programming • DTP • Video • Business software and more.

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Issue 11 March 1992

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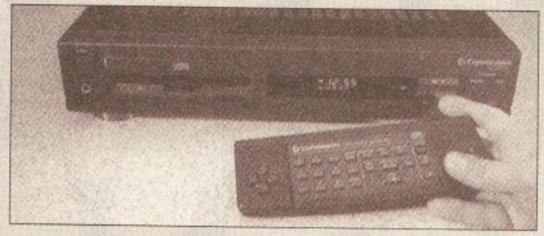
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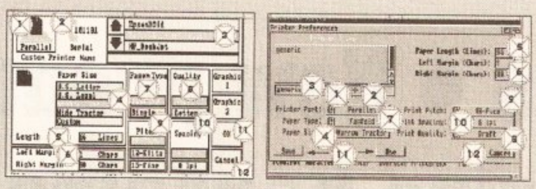
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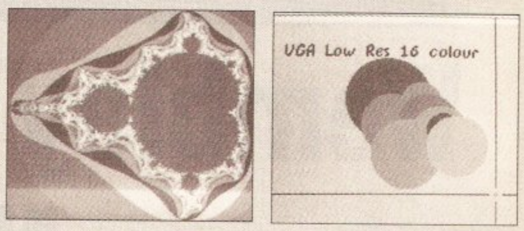
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Three New Amigas Waiting in the Wings

Industry sources close to Commodore US have revealed plans for as many as three new Amigas. The rumours suggest that the A500 Plus marks only the beginning of a radical re-structuring of the Amiga line-up.

The additions to the range are the A300, a cut down version of the A500, now no longer in production; the A800, a mid-range machine with increased processing power; and the A4000, due to snatch the crown from the A3000 as king of the Amigas. All are due for release within the next 18 months.

News of the first of these was leaked some time ago, causing uproar amongst developers at the time. *Amiga Shopper* can now state that the machine will *not* be a console-based Amiga as some have suggested, but a fully fledged computer. It will have 0.5Mb of RAM, but will come without a numeric keyboard and with limited expansion possibilities. Some sources suggest the machine will be unexpandable, perhaps even without a keyboard or with an infra-red controller as used with CDTV. It seems more likely, however, that the machine is intended to fill the gap left by the 0.5Mb A500, but at an even more attractive price. As such, it is almost certain that it will retain a keyboard and at least some possibility of expansion.

The price is expected to be some way under £300. In the current economic climate a cheaper Amiga seems an attractive proposition. It's likely that Commodore hope the machine will compete with the more limited console systems – not only is there a wealth of excellent games software already available for the Amiga, but the more interactive nature of a computer gives it far more educational and creative potential.

The A800 is rumoured to be an Amiga based on the faster, more powerful Motorola 68020 processor. It is expected to come with 16-bit, CD quality sound as standard, and may well be with us by the end of the year. Some sources suggest that it will be bundled with a hard drive and monitor.

Many have seen the launch of the A500 Plus as creating an imbalance in the Amiga range, with the B2000 and A1500 uncomfortably sandwiched between it and the A3000. The A800 would provide an attractive mid-range solution.

Finally, the A4000 is said to be the forthcoming top-of-the-range Amiga, based on the brand-new Motorola 68040 processor. Other goodies include 16-bit sound as standard and, most interestingly, 24-bit graphics, bringing the machine into direct competition with professional workstations such as those produced by Sun and Apollo.



Launched in May 1990, the A3000 is currently top of the Amiga range. How long will it stay there? 1993 could well be the year of the A4000

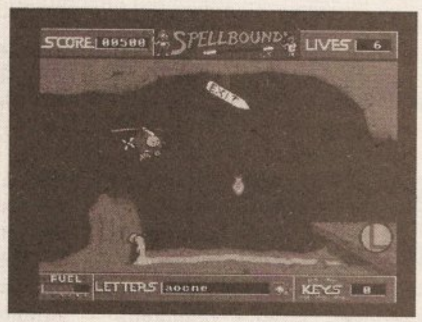
THE RISC BUSINESS

Commodore has stated that it intends to continue development on the Amiga range, and the A4000 is just one of the possible high-end Amigas that may be appearing in the future.

Rumours are still circulating of a RISC-based Amiga, providing yet more processing power.

Meanwhile, more down-to-earth Amiga users can only wait and hope that the advantages of Commodore-approved 16-bit sound and 24-bit graphics will filter down to their machines.

Educational package materialises from Lander Software



Our hero, armed with nothing more than a death-spitting helicopter, braves the horrors of the subterranean world in an effort to become a man of letters

Scotland-based educational software house Lander Software (formerly Scetlander Software) has released a new package by the name of *Spellbound!*

The package is intended to develop logic, memory and spelling skills. Unlike the company's previous releases (*Henrietta's Book Of Spells* and *Hooray For Henrietta*), this one takes much more of an arcade game approach, and as a consequence should also be useful for improving 'spatial awareness, judgement, tenacity and co-ordination'.

The idea behind the game is that the player must defeat the evil Professor Grime by obtaining five keys, hidden throughout five different games, to a secret room. The keys are obtained by the player collecting letters and words.

Spellbound! costs £25.99 and is available directly from Lander Software on ☎ 041 357 1659.

New MIDI Interface



All you need (except for an Amiga and a synthesiser) to get connected to the wonderful world of MIDI

Novice MIDI musicians will be eager to hear of the latest pack from TecnoPlus. It consists of a MIDI interface with leads and *Music X Junior*, a beginners' sequencing program.

The MIDI interface has one input port, two output ports and a port which can act either as a through port or a third output port. It also includes a serial pass-through so that further serial devices can be used in conjunction with it. The package costs £39.95. For more information, contact TecnoPlus on ☎ 0604 768711.

24-Bit Graphics For Less Than £500

True colour images are now available for anyone with Checkmate Digital's announcement that it is to be the distributor of a Avideo, a French-made 24-bit graphics display board costing under £500.

The board gives a full overscan broadcast quality PAL resolution of 768x580 pixels, with a palette of over 16 million colours.

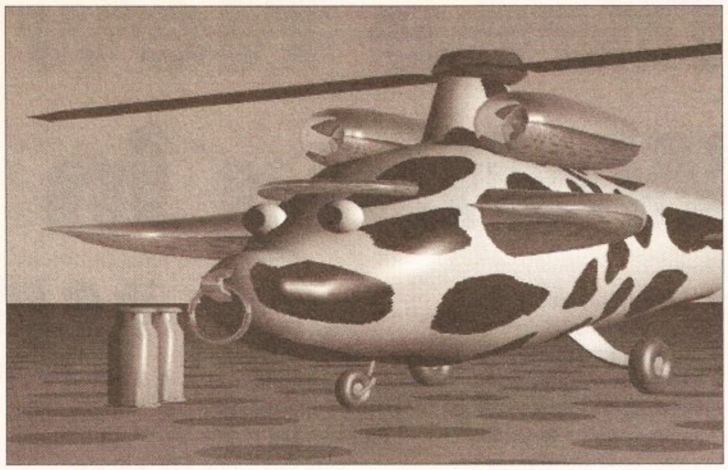
What differentiates Avideo from other 24-bit boards, aside from the price, is the fact that it fits into the Amiga's Denise socket. This means that it directly interfaces with the Agnus chip. Consequently the blitter can access the frame buffer, providing a full screen update in under four 50ths of a second. Real-time 24-bit animation is now a viable option.

Animation possibilities are further enhanced by the board's ability to split its frame buffer into two 12-bit buffers. In this way, data can be written to one screen (with a palette of 4096 colours) while the other is being displayed, thus eliminating flicker.

The board will work with any Amiga, although standard A500s will require a modification to enable the board's video connector to be accessible to a monitor. This video output overrides the Amiga's standard output. The normal Workbench screen is overlayed on the 24-bit screen as if it were genlocked.

At the moment, the board is available for £450. It can be bought bundled with *TVPaint*, the acclaimed 24-bit paint program, for £599, although it should be borne in mind that *TVPaint* requires 4Mb of RAM and a 68030 processor to run. Users of humbler systems will be pleased to learn that a version of *Image Professional*, the paint package supplied with the HAM-E graphics board, is under development. Furthermore, any software packages currently available which support 24-bit graphics will work with the board without problems.

A 12-bit version of the board, giving a display of 4096 colours at the same PAL resolution, is also available for £229, and it is this which Checkmate Digital reckons will become a mass-market device. For more information contact Checkmate Digital on ☎ 071 923 0658.



Images with the clarity and breadth of colour (yes, we know you can't *see* the colour here) of this one are now within the grasp of the A500 owner with £450)

AMIGAS AID ART EDUCATION

A consignment of 105 Amigas has been purchased by the Birmingham Local Education Authority for use in the 80 secondary schools under its jurisdiction. The Amigas have been distributed amongst the schools for evaluation purposes; the idea being that any who find the computers suitable will purchase further models themselves.

The computers – Amiga 500s with 1Mb and colour monitors – have been equally divided between art and music departments. They are being used with Electronic Arts' *Deluxe Paint III* and Dr T's *MRS* music package.

Although many of the teachers in art and design departments are familiar with the Amiga and its graphics abilities, the possibilities that it offers in the area of music are at the moment less generally understood. In an effort to overcome this, the Joseph Chamberlain sixth form college has set up a music technology centre. The centre is funded by the Local Education Authority and the Technical Vocational Education Initiative, and has been given support from Commodore in the form of four Amiga 2000s. Roland, the synthesiser manufacturer, has also done its bit by loaning the centre a number of keyboards, sound modules and loud speakers.

In return, Commodore will receive case study data from the centre to help it develop its range in support of musical applications, and in particular the national currciculum for music. Although the national curriculum as yet has no requirement for music technology, draft statutory orders for music suggests that music technology should be taught to all children. Commodore obviously sees this as a potentially lucrative market, and intends to capitilise on it. With Birmingham's Local Education Authority being the largest in the country since the demise of the ILEA, Commodore has already achieved a significant foothold.

Cats Eyes

Software piracy – or theft as its known in law – is more rife than ever. This has led to some software houses taking strong measures such as fitting "dongles" (electronic protection) to their titles; but many more have gone broke because of it. On the other side of the coin though, FAST are making an increasing number of "busts" aided by the Consumer Advice Centres run by local councils.

As *Amiga Shopper* went to press, a software thief known as "The Armchair Wizard" an unemployed man in his 20s received a heavy fine amounting to several hundred pounds including court costs. "It's not nearly enough," comments an insider, "he can make that sort of money back in a week – and he's costing the whole industry thousands."

But its not quite as straightforward as all that. One Consumer Advice official (who prefers to remain anonymous) told *Amiga Shopper* of his dissatisfaction with the software industry. "We are funded by local authorities," he told us, "and that means community charge payers are funding what is essentially the software houses' problem. Pirates are discovered operating from private houses all over England. Pinning down the culprit is one thing, but local people end up footing the bill."

As the argument becomes more involved daily, rumours of a new system called CATS are starting to appear. We gather the acronym stands for "Computerised Automatic Tracking of Software" and it seems the system (which is undergoing trials now) may bode the final end of mass piracy as we know it. Rumour suggests that CATS is a system by which any item of disc, cartridge, CD or tape-based software can be traced from the moment it leaves the software house, through duplication and distribution and eventually (we assume) into the hands of its new owner.

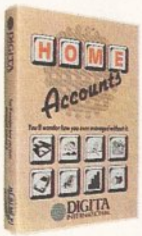
In one fell swoop, CATS seems to remove the opportunity to illegitimately copy titles at any stage, or at least make it very difficult; once a CATS protected copy is retrieved by officials, it can be tracked back to its source in seconds. (It's a bit like following the branch of a tree back to its roots.) It is patently obvious though that the system cannot stamp out school yard swapping – this can be combated by conventional protection. CATS targets the original culprit and by legally plugging the leak, a flood is effectively prevented.

Details of how the system works at point of sale were not available at time of going to press, although this reporter feels there may be some "Big Brother" animosity felt among some users. Nevertheless, the prevention of piracy means software will become cheaper eventually, and that's good news for everyone.

The Digita range...



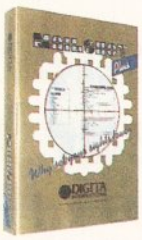
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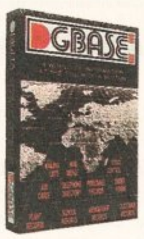
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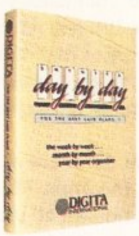
DGCalc
This fast, simple spreadsheet includes many advanced features, including a windowing facility, so that you can look at different parts of the spreadsheet at the same time. **£39.99**



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If you ever need to send out mailings or print labels, this program is for you. Animated labels appear on-screen as a continuous sheet, allowing you to scroll backwards and forwards. You can search, sort and detect duplicate labels, print side by side and much more. **£49.99**



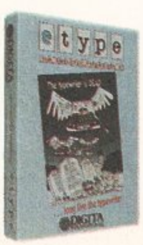
DGBase
If you're looking for fast access to information, and the ability to create customised reports, then this relational database is for you (ST). **£49.99**



Day-By-Day
An excellent way to get organised. You'll be reminded of birthdays, meetings and appointments. It includes month/week/day planners and automatic reminders of overdue events. **£29.99**



Personal Tax Planner
Plan your own tax with ease. This simple program will calculate your income tax liability, allowing you to perform instant 'what-if' calculations and produce pertinent facts about your tax position. A professional version is also available for accountants and financial advisers. **£49.99**

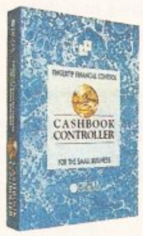


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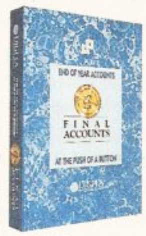


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System 3e
Like System 3, but with extended capacity for customer accounts and stock items. **£79.99**



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Take the drudgery out of book keeping as this program will replace your cash and petty cash books. In addition to recording cash, bank and VAT transactions, you can enter credit sales and purchases, and for all these entries the program will automatically complete double entry routines, to ensure your records are always in balance. **£59.99**



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Cashbook Combo
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The Digita range is available for Commodore Amiga, Atari ST and IBM PC unless stated otherwise, and every program comes with a seven day money-back guarantee.

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Shopper Show Set!

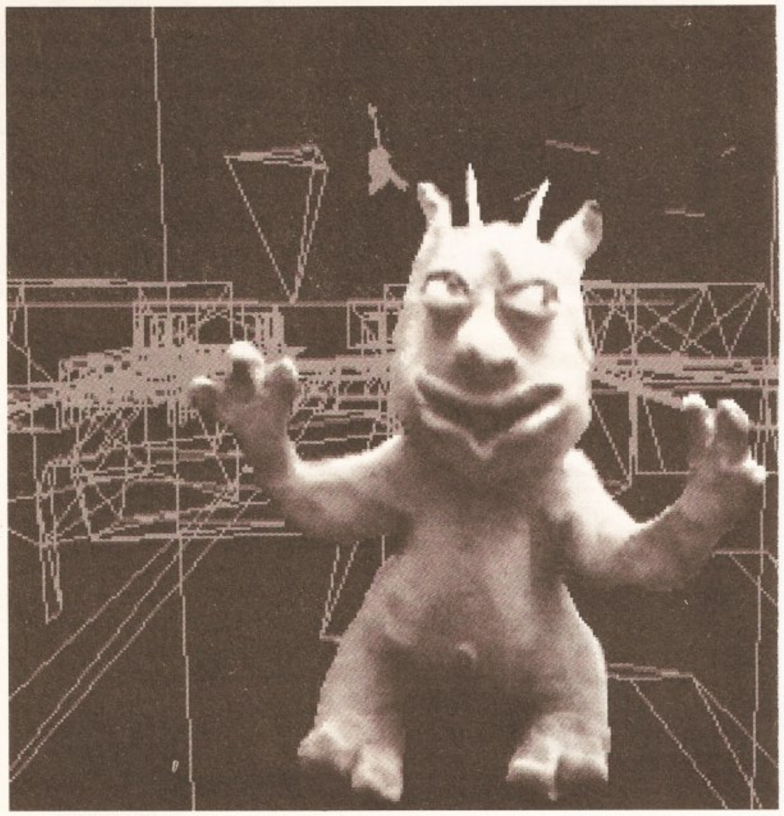
HOLD ON TO your hats, folks, because the *Amiga Shopper* Show is on its way, and it's going to be *the* place to be for anyone serious about their Amiga.

All of the big name exhibitors will be there, and some exciting new launches (which they won't let us tell you about yet!) are promised.

In addition, there'll be bargains galore, from floppy disks to 24-bit graphics systems. Light relief comes in the form of a games arcade.

The show looks set to be a biggie, with 50% of the World Of Commodore exhibitors having already booked space in the first two weeks of the new year. Companies scheduled to be there include HiSoft, Silica Systems, Gasteiner, and Care Electronics.

The show will be taking place in Wembley on the 15 to 17 May. The ticket hotline is ☎ 051 356 5085. Companies interested in exhibiting should contact Mike Jennings on ☎ 0225 442244.



One of the rather alarming entries to Amiga Centre Scotland's Animation Competition. This is Virus by Mark Bleakwell and Martin Nugent, and is featured on the video *Animation '91*

Animation Winners on a Screen Near You

New version of PageStream shipping

At last, version 2.2 of Soft-Logik's *PageStream* DTP package is on sale.

Enhancements to the package include driver support of more printers. Plotters are now also supported. The package's look and feel has been altered to fit in with Workbench 2, and it includes a faster displaying font/dialog box. Also, improved Type 1 extended character set support.

Support is provided for Soft-Logik's yet to be released *HotLinks* program. This will enable data to be readily exchanged between *PageStream* and other programs. For instance, a file connected to *PageStream* via *HotLinks* can be edited independently and the changes updated within *PageStream*.

PageStream 2.2 costs £199, and is distributed by HB Marketing (☎ 0753 686000) and SDL (☎ 081 309 1111). Users of version 2.0 or 2.1 can obtain a free upgrade; users of earlier versions will have to pay £67. All upgrades must be obtained from Soft-Logik on ☎ 010 1 314 894 8608.

Printer becomes a flexible friend

A number of new products from Care Electronics could be set to take the edge off those printer blues.

Firstly, there is an upgraded version of *Flexidump*, the popular printing program for colour printers. The new version can print posters by automatically splitting large images into sections of A4 sheets and printing them one after another. Gamma correction is also included, to help get the best out of colour mixes. The new version costs the same as the old, £39.95; an upgrade for existing owners is available for £11.75

Care Electronics has also released *Flexijet*, a version of *Flexidump* suitable for the growing range of bubble-jet printers. The program will provide dumps at a resolution of 360 dots per inch, and includes an auto-colour separation feature. Flexijet costs £49.95.

Also new is the Care Colour Kit. This provides a clever solution to producing colour output from mono printers. Three colour ribbons are supplied which, when used in conjunction with the printer's black ribbon, are used in a series of passes to provide full colour images. The package comes with software based on the Flexidump program. It costs £39.95. Care Electronics can be contacted on ☎ 0923 672102.

New hard drives launched

Hard drive manufacturer Expansion Systems has released a new line of Dataflyer hard disk drives and controllers for the Amiga.

Unlike the company's previous models, which used the industry standard SCSI interface, these new models accept the IDE and AT hard drives commonly used with IBMs. These drives are cheaper than their SCSI counterparts, and are also claimed to be faster. For the those who choose to sit on the fence, versions of the controller cards are available which accept both SCSI and IDE drives.

Formatting software is provided, as is an interleave optimizer and a game switch. The drives are compatible with AMAXII, the Apple Mac emulator. All of the cards accept the Dataflyer RAM cards which plug on to the controller card and provide up to 8Mb of expansion RAM.

Typical prices are £199.95 for an A500 IDE controller (in a case) and £99.95 for an A2000 IDE controller (slots into an expansion slot). An A500 IDE/SCSI controller costs £259.95; with the A2000 version costing £179.95. An unpopulated RAM card costs £149.95.

Hard Cache Sales is a distributor to the trade, and can be contacted on ☎ 071 704 1614.

Accelerator and networker re-vamped

The Fusion Forty accelerator board has had a heavy price reduction and been taken on by Analog Electronics for UK distribution.

The board, by Canadian firm RCS, was the first 68040 accelerator upgrade for the Amiga. It sports a Motorola 68040 running at 28MHz with a 4K data and a 4K instruction cache, along with 4Mb of 32-bit RAM. At the new price of £1395, it is hoped that the board will achieve a significant share of the accelerator market.

Analog Electronics has also re-released Hydra Systems' Amiganet networking system. Amiganet originally appeared two years ago but was withdrawn because of legal problems over its software. The software has now been totally re-written, and is included with the hardware and all relevant cables for £395 for the A2000 version, or £295 for the A500 version. It may seem expensive for a single network node, but Amiganet does work on a multi-server basis: each node in the network requires Amiganet and nothing more, rather than one Amiga requiring a dedicated server system. Analog Electronics ☎ 0203 471111.

The video, *Animation '91*, contains 38 animations in all, including the winners in each of the three categories. The categories were commercial, non-commercial and an Eric Schwartz Award. The latter went to, wait for it, Eric Schwartz for his outstanding contribution to Amiga animation, in particular *The Dating Game*, *Anti Lemmin' Demo* and *ATF Agility*.

The commercial category was won by Ken Blakely with *The Fly*. A Harlequin 1500, donated by Keybonus, went to Paul Franklin for his Mondo Data Phage animation. A host of runners up also received prizes, donated by Checkmate Digital, Electrocraft, Electronic Arts, Future Publishing (that's us!), Intac Data Systems, Interactive Publishing, Marcam and Tecsoft.

The entries were judged by a panel of three: John Butler of Scope Picture Productions; Jessica Langford, originator of the Edinburgh Film Trust Animation Workshop; and Jack Shea, senior lecturer in Film and Television at Napier College, Edinburgh.

Martin Lowe of Amiga Centre Scotland congratulated the judges on their 'skill and judgement to ensure a fair allocation of winners'. He went on to thank the companies who donated prizes, and to commend the 'originality and technical quality of many of the animations'.

Animation '91, is available for £15 from Amiga Centre Scotland ☎ 031 557 4242.

New CD Drive and Bridgeboard Ready

THE LONG-AWAITED A690 CD ROM drive is now in the UK and should be shipping by the end of March.

The device plugs into an A500's side expansion port and gives all the facilities of a CDTV. The cost should be just under £300. In addition to turning an Amiga into a CDTV, the A690 can be used as a CD-ROM drive. It conforms to the ISO 9660 standard, meaning that the discs have the same structure and use the same data format as those used by IBM PC and Mac CD ROMs, and can, in theory, read discs designed for those machines.

Obviously, programs written for one machine will not work on another, but the sharing of data is a possibility. Already, the CDTV titles *King James' Bible* and the *Complete Works Of Shakespeare* can be used on an MS-DOS-based PC. Once a few enterprising companies have developed data conversion software, the Mac and PC world will provide the Amiga user with a wealth of CD software in addition to the available CDTV titles.

Rumours are also circulating about a new Commodore PC bridgeboard, ready and waiting in the UK. The board is based on the Intel 386SX processor, and should sell at around £400. The 386SX is a more powerful chip than the 286 used in Commodore's old AT bridge-board, and it offers better memory management and multi-tasking. Not only is the board more powerful, but it's also cheaper than the older 286 bridgeboard. Disappointingly, the only graphics adaptor supplied is the outdated CGA standard.

Amiga offers succour to dyslexics

A new software package from Sally Systems looks set to offer relief to dyslexic children in the classroom.

Dyspell was developed by Max Lipman, whose dyslexic son was doing badly at school. After a term of private tuition, Lipman's son returned to school and became top of the class. Lipman concluded that there was no problem with his son's ability, and that dyslexia is a surmountable impediment.

Observing the tutor with his son provided Lipman with the information he needed to create his system. He noticed that 'a lot of the exercises involved seeing something with the eye and then doing something mechanical with the hand so that the connections were forced to be made'. He reasoned that many of these exercises could be dealt with by a machine, leaving a teacher free to deal with those aspects of tuition requiring a more personal approach.

Lipman chose the Amiga to develop his system on because of its low price, and its graphics and speech abilities.

Dyspell has a backgroud theme of three different historical periods: medieval, machine age and the future. It helps the child improve spelling and reading skills, although a future version is intended to deal with sequencing problems. With dyslexics accounting for up to 10% of the nation's school children, *Dyspell* is doubtless a valuable system.

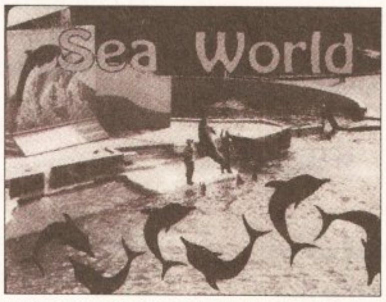
Sally Systems markets the package along with a 1Mb A500, a 20Mb hard disk, a monitor, an MPS-1270 printer and a monitor stand, together with the Class of the 90s software pack, for £1750.75. Alternatively, the software can be bought separately for £411.25. Sally Systems ☎ 0628 24626.

GERMAN GENLOCK JOINS THE FRAY

GERMAN-BASED COMPANY Electronic design has launched a new genlock, called the Sirius.

Compatible with all Amigas, the Sirius Genlock includes a colour splitter for use with digitisers such as Digiview. Another feature is key invert, by which means the Amiga background, over which the video image is normally displayed, becomes the foreground of the image and all other portions of the Amiga display are covered by the video image.

The unit is available in two versions. One, costing £349.99, uses PAL composite video for input and output. The other gives the option of S-VHS input and output, and costs £449.99. The Sirius Genlock is produced by Electronic Design on ☎ 010 49 2262 6446. It is marketed in this country by Genlock Ltd ☎ 0257 472887.



Splash out on a Sirius genlock and create some seriously good videos

DIARY DATES

February 8: All Formats Computer Fair. Northumbria Centre, Washington. ☎ 0225 868100.

February 14-16: 16 Bit Computer show. Wembley Exhibition Centre, London. Westminster Exhibitions ☎ 081 549 3444.

February 23: All Formats Computer Fair. National Motorcycle Museum, Solihull. ☎ 0225 868100.

March 8: All Formats Computer Fair. City Hall, Candleriggs, Glasgow. ☎ 0225 868100.

March 14: All Formats Computer Fair. Horticultural Hall, Westminster. ☎ 0225 868100.

May 15-17: Amiga Shopper Show. Wembley, London. ☎ 051 356 5085.

MAKING THE NEWS?
Make the call:
0225 442244

IN BRIEF

AMIGANS TAKE POLAROIDS

Graphic artists needing to produce colour slides will be pleased to learn that the Polaroid CI-3000 Digital Palette is now compatible with the Amiga.

Plugging into the Amiga's parallel port, the CI-3000 exposes digital computer images on to instant or conventional 35mm slides with a resolution of over 2,000 lines and with up to 16.7 million colours. The software that provides the interface is ASDG's *Art Department Professional*, together with a software driver module.

***Art Department Professional 2* costs £211.50; the interface module for the CI-3000 costs £129.95. Both are available from HB Marketing ☎ 0753 686000. The CI-3000 itself costs £4641.25 from Polaroid UK ☎ 0727 59191. The price includes 12 rolls of instant and 12 rolls of conventional film.**

PRICES SLASHED ACROSS ICD RANGE

American hardware manufacturer ICD has announced sweeping price cuts across its range.

Apparently, the company motto is: "ICD offers the best product, at the best price, with the best support." President of ICD, Thomas Harker, felt that two out of three was not good enough.

Power Computing, UK distributors of ICD products, has adjusted its prices accordingly. Reductions of note are the Novia 20i and 40i internal hard drives, down to £199 and £325 respectively, and the Flicker Free Video card down to £199.

ICD is on ☎ 010 1 815 968 2228; Power Computing is on ☎ 0234 843 388.

Talking Shop



Welcome to your letters page. – The only place to be if you're at all serious about your Amiga.

If you've got a view then send it to:
Andy Storer, Talking Shop, Amiga Shopper, 30, Monmouth St, Bath, BA1 2BW
You never know, you might win £20!

WARRANTY TIPS

Last year I purchased an Amiga 500, a monitor and a 1/2 Meg memory board. All went well until I treated myself to a second disc drive. The Workbench reported all my discs as "DF1:BAD".



Thinking that the drive was faulty, I took it back to the shop and had it replaced. The new drive gave the same errors. It seems the interface for the disc drive was faulty as the shop was able to demonstrate that the disc drives were working.

Fortunately, my machine is covered by the Sale of Goods Act and the shop has been helpful on this matter. If I had not had the chance to check this part of my machine until after the warranty had run out, I may have been involved in a protracted legal argument. It would be difficult to prove that the interface was faulty when the Amiga was purchased.

My point is to prompt readers who have bought their machines in the last 12 months to check all the elements of the machine.

It may be necessary to borrow a printer, modem and monitor from friends in order to perform these tests. If these tests are not made before the 12 month warranty period expires, some people could find themselves buying equipment that they cannot use.

I would also appreciate enlightenment on the legal position of those people whose faulty machines are more than a year old.

Alan Baker
Bournemouth, Dorset

I'm afraid there's no legal position open to people whose faulty machines are more than a year old, Alan. A 12 month warranty is a 12 month warranty full stop. So your advice to check all the appropriate components is sound. Not that I'm out to cause a panic by scaremongering – it's just that over Christmas a lot of new machines will have been bought, that's all, and now's a good time to check.

NEWS FROM CANADA

In reading your December issue of *AS*, I felt obliged to write you this letter concerning third-party developments of 24-bit graphic cards and 16-bit sound cards.

Although it is very exciting to see such enthusiasm put into the Amiga market from these companies, a nice tip should go to potential buyers: Commodore has developed a newer chip set to handle graphics and sound (and I'm not talking about the ECS).

Of course, the management team at Commodore have had a policy, that started 2 years ago, not to talk about new products until they were ready for release, so don't expect any more details.

The new graphics chip set, as conceived, should be displaying 4,096 colours in standard modes and possess a new HAM mode displaying 65,536 colours at once. Those of us who need true colour for applications can buy plug-in cords to get that kind of resolution and colour. A faster Agnus should be expected, to cope with the extra bitplanes, and the Mega-Denise.

As for sound, Commodore in co-operation with Roland, has devised a "Super Paula", which will put the Amiga at the top musically. This chip will feature 16-bit sound, exceeding CD sampling rates, over 16 voices in 8 stereo channels.

Nothing was said about DSP (Digital Sound Processing), although the technology and know-how is readily available by Roland.

These will be the new standards all software will be conforming to once the chips are available. They won't threaten 24-bit developers, and they will inject new life in the poor-by-today's-standards Amiga graphics.

These projects were put together over a year and a half ago, just like the 2.04 ROMS (shipping since November), so we should hear about a shipping date in early 1992 for these products. I don't feel it will put the Amiga in the same position as the STE, as this will be offered as an upgrade kit for existing Amigas, and from experience I can say they will sell like hot cakes, as this is what Amiga owners have been begging for since the A300.

A Canadian Spy
Canada

Mmm...interesting...I wonder how it ties in with our main news story? Personally I love rumours like these, as long as they have a solid basis in truth, and I've come across your revelations from other sources too. So keep 'em coming... and any more spies out there who'd like to drop me a tip-off please do so at 'Deep Cover Corner', *Amiga Shopper*, 30 Monmouth St, Bath BA1 2BW.

DIY A1500/2000 WORKBENCH 2

I read with interest your readers' queries regarding an Amiga 1500/2000 with Workbench 2.

Like many of them I already had an A500 and wanted to expand with a hard drive with possible further expansion at a later date without a strengthened desk to support all the boxes hanging off the side. But, most of all, I wanted Workbench 2 and couldn't wait for ever...

At the Earls Court show, Commodore could not give me a definite date for a Workbench 2 1500/2000 so I acted as follows:-

I purchased an A500 Plus and ordered a Checkmate A1500 including a GVP/Quantum hard drive with 2 megabytes on board. I ran the A500 Plus non-stop for a week (a kind of soak-test!) so that if anything was amiss it would happen sooner rather than later, as I was about to kiss goodbye to the warranty.

I dissected the A500 Plus and installed it in the Checkmate box (much sexier looking than the rather boxy 1500/2000). This included installing my external floppy inside the A1500 as well. Hats off to Checkmate for a clever and well thought out design.

Finally, as all was well I advertised my old A500 in the local paper and it was sold within a day (ideally timed before Christmas).

Result? A 1500/2000 with Workbench 2, hard drive and extra memory and better looking than Commodore's 1500/2000 to boot.

The risk of this approach is that it is no longer under guarantee, and this should be borne in mind if other readers proceed with this option.

Roger Kille
Danehill, East Sussex

A neat idea Roger – providing you got a good price for your old A500 and nothing blows up in your face!

1 POUND = 1 DOLLAR

I have been a Commodore user for some 10 years now, and have been devoted to the Amiga for nearly 5, but I have never seen the "leeches" abusing users so much.

Yes, I'm talking about those suppliers so prevalent within the pages of all the UK Amiga mags, who are ripping UK Amiga owners off with hugely inflated prices for imported American products.

With the \$1=£1 (or worse than that) exchange rates these guys are using, you have to ask "what price fair trading" – their profit margins are nothing short of obscene! The following examples give a good idea of what I mean and, assuming

continued on page 14

continued from page 13

the average exchange rate over recent months of $1.75 to the £, compare current advertised UK distributor retail prices for a selection of GVP, Blue Ribbon Soundworks and Dr T products against those quoted by a major US Distributor (in the December issue of the American mag Amiga World):-

Product		
	US Price	***UK Price***
GVP 680/33-4 board	**$1399 (£799)**	**£1299**
GVP series II HC8 Hard Card - with 105 Mb Drive	**$520 (£300)**	**£499**
- with 200 Mb Drive	**$899 (£514)**	**£899**
GVP Impact Vision Card	**$1899 (£1085)**	**£1799**
GVP 8Mb Ram Card with 2Mb	**$159 (£91)**	**£179**
Bars and Pipes Pro	**$209 (£119)**	**£299**
Bars and Pipes Add Ons	**$32.95 (£19)**	**£49.99**
Blue Ribbon's Jam	**$69.95 (£40)**	**£99**
Dr T's KCS	**$229 (£130)**	**£279**

Enough said? Given that these distributors will be buying stock at *trade* prices from the States, doesn't this show how much the UK customer is being ripped off? The "extra" profit margin added on in the examples ranges from a staggering 62% to a mind-blowing 151%!

Until such time as one of the mags takes a real stand on this issue (how about it *Shopper*, or are you too afraid of your advertisers?), things are never going to improve.

UK Amiga fans should boycott these extortionists. From experience I know that a quick evening phone call to the States with your VISA number wil get you most Amiga hardware and productivity software at a huge saving (customs duty and airmail postage is not that expensive). As long as it doesn't need a mains supply, you're generally better off buying from the States, and delivery is almost as quick as it would be from a UK supplier (ie 7-10 days).

I know that whenever this issue has been raised before, any response from UK dealers has inevitably focused on after-sales support and service, but that joke is beginning to wear a bit thin.

To put it bluntly, most of them (though again I admit not all) either don't know or don't want to know once they've got your money, and none of them offer the sort of after sales service or help-line facilities that US customers have. But then, I suppose they could say they are only following Commodore UK's example, couldn't they?

Geoff Sampher
Gillingham, Kent

Ah yes, a little vitriolic, that's what makes a good letters page and Geoff's kicked into this month's with a corker. At first sight, Geoff, your letter seemed to make good sense, providing you have a Visa card, but then I phoned a couple of importers and got the other side of the story.

First of all, they dispute the fact that a straight dollar for pound exchange rate applies in any case, pointing out that it's somewhere in between an equal exchange and the official rate. But their mark-up, or as you put it, blatant profiteering, is made up as follows. Between 8% and 10% is automatically added to the US retail price for freight and duty followed by a further 17.5% to cover VAT. Also, the US ads don't include their version of VAT, the local sales tax, which is between 4% and 8% depending on the area. Applying an average of these overheads to one of your examples – let's say the GVP 680/33-4 board – we arrive at the following comparison:

US price
£799 + 6% = £847
UK price
£1299 - 9% - 17.5% = £954

'But that's still another £100 over the top' I hear you say. Well, the answer being that UK importers get nothing like the discounts US distributors do from US wholesalers simply because they can't buy in volume – there isn't the market to support bulk purchases.

And in any case, I'd say the extra money more than makes up for the costs of paying to send broken kit back there, getting it fixed, phoning companies transatlantic to find out where it's got to, paying freight and duty again, ensuring you don't get hit for VAT twice and sitting out delays while Customs check if your kit is full of cocaine. As always, yer pay yer money and yer...

JUST GAME GEAR?

I've recently upgraded from an A500 1.2 to an A500P 2.04. Why has Commodore not really supported a language on the A500P? It no longer supplies AmigaBasic as software or a manual on ABasic. I know that it can still run ABasic satisfactorily because I have done so having kept it from my old A500.

The A500P's Editor can program C, code, and AREXX plus other languages. Commodore has put AREXX in ROM with rexxsupport.library in LIBS directory:; its own directory REXXC containing nine programmes and REXXMAST (with its icon) in the System directory. Yet nothing is given in the manual on how to write in AREXX. I have never seen a REXX program apart from AREXX! It must be powerful for Commodore to put so much on ROM. I believe it has some connection with Unix.

There is one book about AREXX *Using AREXX on the Amiga* by Kerkloh, Zoller and Tomsdorf published by Abacus. However, any book available will probably not deal with the A500 Plus and this creates a gap as the A500 Plus continues to sell during the next year or so.

Commodore has been criticised for presenting the A500 as a games machine. Yet we all know what a wonderful machine the Amiga is and how much power it has to cope with all aspects of social and business life. I have concluded that Commodore is content to promote the Amiga in its games packaging as it is selling like hotcakes!

Douglas V Griffiths
Saxilby, Lincoln

Yep Douglas, point taken. You'd think that even if it couldn't bundle its own manual, Commodore would tell you where to get more info. Fortunately we can. Check out *Using ARexx on the Amiga* from DTBS on 0706 524304. Or you could track down Fish disks 463,459,450,306 and 297 for some neat PD programs with documentation. AS

SO WHICH IS THE BEST? – THE ARC OR THE AMIGA?

A friend who teaches media studies has persuaded the PTA at his school to buy an Amiga for TV/Video and since being installed it is quite noticeable that the students have used the machine for many applications much more enthusiastically than on the Acorns.

This is not to say that I am totally happy with the Amiga. I must say that the speed of the Arc is very impressive and the screen resolution for most applications is superior. This is one area that really bugs me. The resolutions of the Amiga are far from adequate in some applications.

This brings me to the main reason for this letter. I have now outgrown the A500 and have the necessary funds to move up to the 1500 with HD. I would like you to give me your reasons to stick with the Amiga in preference to changing to an Arc. It would be nice for you to just this once give an unbiased answer as it is one of the areas that I most often have to give personal opinions on. I have a large software base and this attracts me to the Commodore machines although I would wait until the ECS is fitted as standard.

It's down to the Amiga or Archimedes, both are around the same price so your advice is crucial.

C Bancroft
Heanor, Derbyshire

Just read the next letter...

Why is the Amiga such a bloody good computer?

I see my school getting 50 Archimedes 3000s and then watch them crash all over me. I hear of businesses going bust because they have had to fork out so much for a PC; and I constantly meet Atari ST owners desperately trying to flog their archaic machine for a mere £50 or so.

And then I come home to my Amiga sitting innocently on my desk waiting for me to effortlessly rescue some lemmings, compose some marvellous music in full stereo, or watch a 4096 colour sideshow...

And I think "OOH" I could have bought the trashiest PC or Archimedes for more than double the price of my Amiga 500!

Ross Cameron
Sheffield

I thought I'd drop in Ross's letter as proof of the benefits of the Amiga from a real user's point of view, but if you want my opinion then I'd say go for the Amiga too!

There's no doubt the Arc is faster and more powerful, it's got prettier icons, a more generally attractive user interface, and err.. not a lot else.

Look at it this way, why are there eight Amiga magazines in this country alone? Because there are a lot of Amiga owners? Well yes, but because there's a lot of advertisers too. And why are there a lot of advertisers? Because there are a lot of products available for the machine. The Amiga's selling in droves and more and more titles are being released for it. This is the key to a machine's long term success.

With the Archimedes you're looking at a market limited by its niche – education. You're not looking at developers who specialise in video, graphics and audio, you're not looking at more and more business software or hundreds of free or shareware programs, you're looking at the disappointing results of a lousy marketing campaign by Acorn.

A couple of weeks after you read this, Commodore will be shipping the A1500 Plus. So, just ask them for the number of your nearest dealer and don't look back.



Serious CDTV

Is CDTV an executive's toy or a serious plaything? Mark Smiddy explores a range of some of the specialist software available

It was launched at the British Association of Film and Television Arts, by presenters from BBC's _Tomorrow's World_. It has been hailed as the most important development in home education ever; the most exciting new computer product of 1991; and an answer to questions yet to be asked. The CDTV is an example of the newest idea in information technology – interactive multimedia. This dreadful Americanism is a typical example of overstated hype to describe a simple idea – a TV you can control. Or, put another way, a talking book with animation and sound.

The CDTV is not unique in this area. One of the largest consumer electronics companies in the world, Philips, has its own hi-tech – high-spec system. Produced in association with Sony, CD-I apparently beats the CDTV into a cocked hat. But as history has shown, being the best does not necessarily guarantee success.

Take Sony's ill-fated Betamax system for instance. Although costing slightly more than JVC's Video Home System, it produced far better picture quality. Look at the label on videos at any high street TV specialist – chances are they all say VHS. Betamax is long since dead; beaten not by poor marketing or market reaction, but by release date – when it arrived, VHS was already well established in rental stores, and therefore, in homes. Time will tell if the same fate awaits CD-I, because like Betamax before, it is also more expensive than its competitor and has arrived late; perhaps missing the boat.

Another similarity exists in that CDTV has a much wider range of titles available and more are coming all the time. Three were released during the compilation of this article and many more are planned for release during early 1992. Time (and Commodore's best-selling C64) has also shown that it's software – not hardware – which sells computers. The major part of this feature therefore, concentrates on the wealth of information that has already appeared on just a few compact disks; with 650Mb to play with, the average disc can hold the entire works of Shakespeare or the entire King James Bible several times over.

JARGON BUSTING • JARGON BUSTING

CDTV – Commodore Dynamic Total Vision

Disc – As opposed to the variant spelling 'disk' (which refers to floppies) disc is used here to refer to a compact disc.

HAM – Hold and modify. A screen mode used on the Amiga and CDTV where up to 4096 colours can be displayed simultaneously. Although HAM pictures can be a little grainy, they are usually the best way to display still photographs and slides.

Hamster – A mouse sans tail; or put another way a remote control mouse.

Multimedia – An inexact term (American hype) used to refer to any system capable of providing information in several different flavours: graphics, sound animation text and so on. The actual media (where information is stored) is usually a single compact disc.

Programme – A CD presentation is a programme – like a television programme. The variant spelling program is used to refer to computer software.

Trackball – An upside down mouse – with more ball.

HUTCHINSON ENCYCLOPEDIA

The _Hutchinson Encyclopedia_ is supplied with the CDTV and as you might expect from a freebie, it leaves more than a little to be desired in some areas. The conventional edition of Hutchinson's Encyclopedia has been in print for something like 40 years, but the 1991 CD edition is a brand new entity in its own right. It contains over 25,000 articles and 2000 illustrations, plus maps from Independent Television News and sound recordings from the archives of Aunty Beeb. From those specifications alone, you may gather what multimedia is about.

The introduction is promising – a guided tour through the programme's many features. Not surprisingly, this highlights its better ones and includes a shot of John McEnroe backed with an actual recording of McEnroe's famous argument with the referee over a suspect call. "That ball was on the line. It was clearly in," wails McEnroe. "The Linesman



"Is Commodore Dynamic Total Vision all hype or true hypermedia? Let's find out..."
Mark Smiddy

SHOPPING LIST

Hutchinson's Encyclopedia........ Free
Produced by: Attica
Unit 2, Kings Meadow,
Ferry Hinksey Road
Oxford OX2 0DP

CHECKOUT HUTCHINSON ENCYCLOPEDIA

Graphics ●●○○○
Mostly monochrome and in short supply.

Sound ●●○○○
What there is is good, but it's also thin on the ground.

Ease of Use ●●●○○
Finding what you want can be a real chore.

Performance ●●○○○
Aggravatingly slow at times.

Price Value ●●●●●
At least it's free and the update doesn't cost too much.

Overall rating ●●●●○
Not one I'd pay for – but a nice freebie.

called a fault because the ball was on his side of the court..." replies the referee, obviously tired of McEnroe's temperamental bickering. The emotion present in this entry (under Lawn Tennis) and McEnroe's exuberance in the monochrome shot clearly justify the advantage of multimedia over conventional methods.

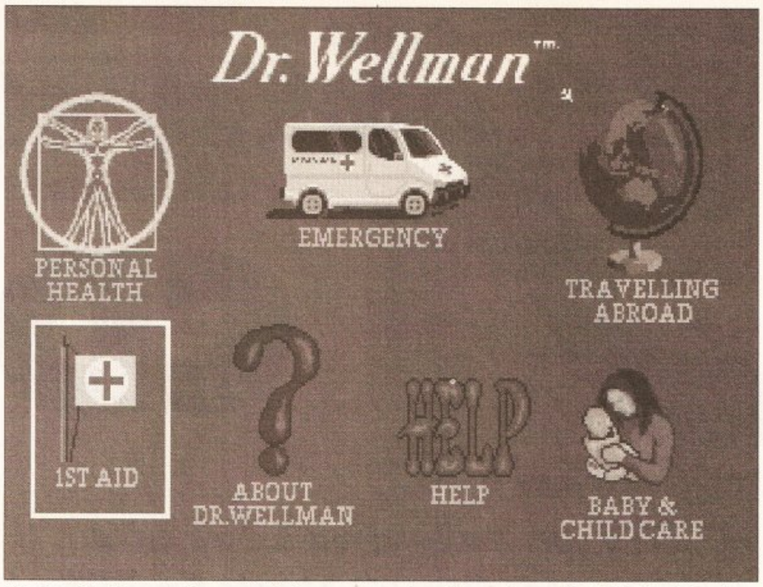
The main screen splits into four sections: Title Find; Index; Maps and Pictures. These work as follows:

● Title Find: This is a list of the entries by title (as the name suggests) and is really just a glorified contents list. The alphabet appears at the bottom of the screen and the search of contents can be narrowed down by entering a sequence of letters. It works like the "high score" table present in many older arcade games – you move the cursor to each letter and press a button. As each letter is entered, the revised list of items appears. Once you find the entry you are interested in, you simply select it from the list. At the bottom of each screen, two icons determine if sound and graphics are available for that entry; although sounds (if available) are always played with the pictures.

● Index: Just that – an index of all the major words held in the encyclopedia. Selections are made using the same awkward system as employed by the contents.

● Pictures: From this selection, the encyclopedia randomly pulls out pictures from its library of 200 images.

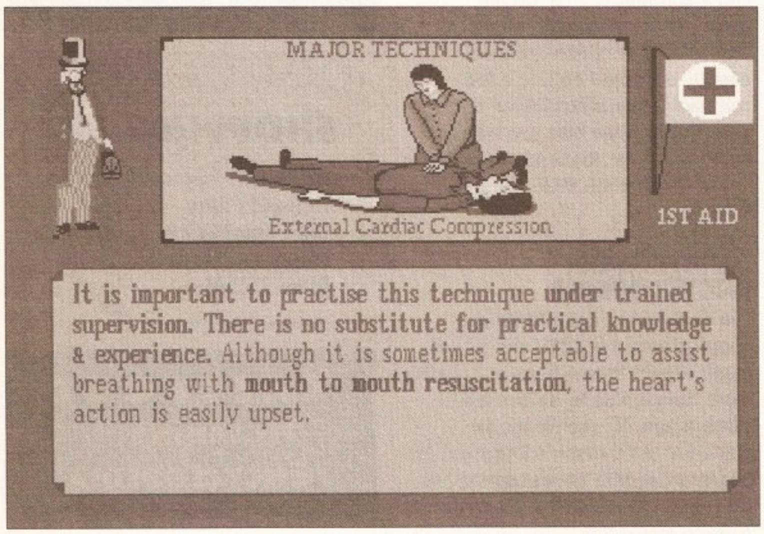
This gives children (in particular) access to a vast library of pictures they can search at leisure, find something of interest and then read the accompanying story at the push of a button.



***Doctor Wellman* – the complete onscreen health system. It's full of advice for all the family. The title screen shows how the subjects are divided for quick and easy reference. Hypochondriacs will love this one...**

● Maps: The map section is quite limited in the first release of *Hutchinson's Encyclopedia* and not all countries – in particular those in the eastern bloc – are covered. Although most of Europe, Asia, North and South America are covered, very few cities and states are picked out. The producers freely admit this in the introduction to the disc, but I feel no information would be better than the limited amount supplied. In its present state the map section is more confusing than it is useful.

The major problem with *Hutchinson's* is its lack of interactivity – something which CDTV is really all about. There is no doubt it is a very important reference work, but I was left feeling cheated – as if I would have been better off just buying the "real" thing. However, it should be remembered that this is a freebie and you can buy the next edition for just 20 per cent of the retail price.



Part of the First Aid section of *Doctor Wellman*, giving you all the gen on how to perform cardiac massage. There is also a panic button for emergency situations, but is anyone really so calm that they'd reach for the CDTV?

Sources at Commodore have leaked information which suggests the new version is considerably better, and while the information is basically the same, the package has been improved beyond recognition. I will await the arrival of the new edition with eager anticipation. In conclusion, I would like to say that the poor quality of this title would not stop me buying a CDTV, neither would it convince me to buy one.

DOCTOR WELLMAN

Digita's health system, *Dr Wellman* should be a triumph both for the company and Commodore. The programme took two and a half man-years to develop, and gives a complete guide to getting fit, staying healthy and what to do when things go wrong. What makes it special is the addition of graphics, animation, music and all the other things that standard health encyclopedias lack; all due to the CDTV approach. There is a multitude of graphics, illustrations and eight hours of narration! The system divides into many subsections which are described briefly here; to cover them in detail would take up most of this issue.

> **"There's a panic button with direct access to the emergency section."**

● General Healthy Living: Everybody knows how to keep fit – but can we keep up with it? This part of the system shows what the best exercises are and how to get the best from them – no matter how young or old the individual. This section also encompasses some delicate areas like substance abuse – with particular attention being paid to solvents -"glue" and even lighter fluid sniffing. Covered in the same category are the uses and abuses of legal drugs like alcohol, nicotine and caffeine, plus the harder drugs from cannabis to amphetamines (speed), LSD, magic mushrooms, barbituates, cocaine, crack, ecstasy etc. This follows (though not directly) into looking after you heart and a philosophy section on non-medical ways of controlling anxiety.

● Self-examination: A complete guide to checking the body for suspect lumps (in mammary tissues) and odd little moles (anywhere). Plus a section on the medical examination and what goes on at the doctor's surgery.

● Adult health: Cancer – prevention and cure, B.O., the menopause etc.

● Sex: Is included (although parents will be pleased to hear, this, like other delicate subjects is user-password protected). Covered here are topics like the male and female orgasm, sexually transmitted diseases, sex in later life. Plus specific – difficult to understand – problems like low libido and impotence.

● Later life: A guide to diet and exercise for the elderly – with a health assessment built-in.

● Dental health: caring for your tootsy-pegs, coping with dental anxiety, dental repair, fillings, extractions, orthodontics and endodontics.

● First Aid: Information on how to recognise and cope with a patient suffering with angina, diabetes, heart attack etc. Including how to take a pulse, perform cardiac massage, and clear blocked airways.

● Poisoning: A full section on how to get rid of that unwanted relative and become heir to a fortune. Topics covered here include effects and remedies (where applicable) for Thorn Apple, Belladonna, scorpion stings and snake bites. "In India alone 10,000 people die each year from snake bites!" comments a Digita spokesman.

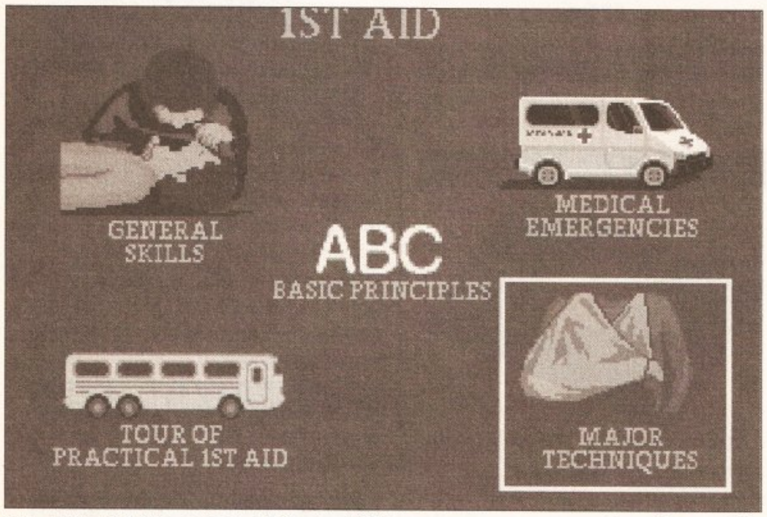
● Travelling Abroad: From here you can select your destination – one of 257 available. This is followed by a short animated sequence and some appropriate music, while the next

continued on page 18

continued from page 16

section loads. It gives information on – climate: rainfall, humidity, average daily temperature; emergency and medical rules; whether or not to drink the water; required clothing; vaccination both mandatory and specific for AIDS (vaccination?), cholera, tetanus and malaria. The latter for instance, has extra details like the fact that malaria vaccinations do not give complete protection. Finally there's a check-list to make sure you've got everything.

● Obstetrics: From planning a family, through conception, foetal development in the uterus... through the first year's development and required vaccinations such as polio, growth charts, child health care etc. And not forgetting the mother – topics include mastitis and post natal depression. There's even a section on that most delicate and emotive of issues, child physical and sexual abuse. But why, oh why, is nappy rash referred to as diaper rash?



The First Aid title screen of *Doctor Wellman* – as you can see from the variety of sub-headings, it contains a mine of information. Whether you're browsing or *need* to know something the screens enable you to access information easily

Finally, and perhaps most importantly, there's a panic button which gives direct access to the emergency section of the program. It would be interesting to speculate however, in a panic situation, how many people would reach for the CDTV player...

Nevertheless, *Dr Wellman* is probably the single most important development for the CDTV and deserves to do well. It's a quality product with excellent narration and masses of important and fascinating information suitable for the family and hypochondriacs alike. The price may look a little high compared to conventional titles – but when you consider you can pay over £100 for a good word processor, *Dr Wellman* is an absolute bargain.

TIME TABLE OF HISTORY – SCIENCE & INNOVATION

Did you know the idea for domesticating dogs was first thought of over 9,000 years ago – in Yorkshire no less; or that Aspirin was first marketed by the Bayer company in Germany at the end of the 19th century 40 years after its discovery; or that everyone in the world today is a direct descendant of a woman living in Africa some 200,000 years ago; or that the first vending machine dispensed holy water? Just four facts from the amazing collection (over 6,200 of them) compiled by Xiphias for the *Time Table of History*.

From the main screen, you can view information in two main ways: the Time Line or by keyword search. An automatic help system is also available, demonstrating how the *Time Table* is used.



Keyword Search: There are 157 entries in keyword search – the main index if you like – from advertising to zoology. Listed at the end of these are several entries on effects – the special buttons which lead to other entries in the *Time Table*, viz:

- Elemental – entries concerning elements and the periodic table
- Frequency – the electromagnetic spectrum (radio, light etc)
- Geological – the geological time-line (pre-history and so on)
- Picture – stories with digitised pictures or graphics
- Power of ten – power zoom from a house on earth to the sun
- Quote – quotes from famous people

Interestingly enough, you can define more than one keyword in any search criteria. The keyword "Solar" brings up a list of 85 items, from inventions to men on the moon. Adding another keyword, say astronomy, narrows the list to just 25 more salient items. An even more powerful search facility can be accessed directly from any descriptive text – more of that shortly.

Time Line: Eight main screens make up the time line – each with its own graphics and up to eight narrated scenes describing major events from the period. Thankfully, the *Time Table* concentrates on facts more than hype.

To wit, sensitive stories such as the destruction of Hiroshima by the Americans and dissolution of the Soviet Union are handled in detached news-like fashion. Each page is coupled to a graph of economic cycles demonstrating how the major events affected the world of the period.

OK, that allows for something like 60-odd scenes – hardly what you'd call using the media to its full. But the time line divides into even smaller segments. The bottom of the screen lists six time periods which are covered by that part of the time line. For example the early 1990s split from 1900 to 1925 in six jumps. Picking one at random, no less than 184 items are listed from 1908 to 1912. Pick one of these at random, let's say Duralumin. Discovered in 1909 by German Alfred Wilm, Duralumin is an aluminium alloy formed with small amounts of magnesium and copper. The new alloy is tough and incredibly light, leading to its use in the Zeppelin airship.

Still not convinced? At the right side of the screen, two more icons are activated for this entry. The first brings up a world map and picks up the exact geographic location where the discovery was made. The second is more interesting for aspiring chemists or the incurably curious (like me); a link to the periodic table of elements. The appropriate elements relevant to this discovery are highlighted. Let's take Magnesium – this is what the *Time Table* has to say, "atomic number 10; atomic weight 24.312; melting point 651 degrees centigrade; a light, silver-white chemically active metal. Burns with an intense white light, releasing great heat."

Staying with the periodic table for a moment, it's worth mentioning the top row of controls. These automatically highlight the elements

SHOPPING LIST

Dr Wellman £54.99
Produced by Digita Multimedia Ltd
Black Horse House, Exmouth
Devon EX8 1JL
☎ 0395 270273

CHECKOUT DR WELLMAN

Graphics ●●●○○
A bit cartoon-like for my taste but clear.

Sound ●●●●○
Excellent and lots of it – narrator 'sounds' like a doctor.

Ease of use ●●●●○
A multitude of illustrated menus and quick search index – simple.

Performance ●●●●○
Very good. Rarely leaves you hanging around.

Price Value ●●●●○
Good value for lots of information.

Overall rating ●●●●○

A mine of useful information – just like talking directly to your GP. Graphics do not do it justice.

SHOPPING LIST

Time Table of History –
Science and Innovation......£39.95
Produced by: Xiphias
Helms Hall
8758 Venice Boulevard
Los Angeles CA 90034
USA

CHECKOUT TIME TABLE

Ease of Use ●●●●●
Superb, almost drives itself.

Graphics ●●●●○
Excellent digitised images and artwork.

Sound ●●●○○
Crisp and clear, but a limited number of sounds, speeches etc.

Performance ●●●●○
Fast keyword search and almost seamless speech.

Value ●●●●○
Superb – a must for everyone's collection.

Overall rating ●●●●○

Overall it's great value for money. It's packed full of facts, is easy to use and has excellent graphics.

that are:

- Solid, liquid or gas at room temperature
- Metal or non metal
- Noble (inert) gasses
- Transition elements
- Radioactive

The current selection(s) remain highlighted while you check the facts about the related elements and their properties. Most people know mercury is liquid at room temperature, but how many can tell you its chemical symbol is Hg?

Returning to duralumin, you may remember it was used in the Zeppelin. What do you know about Zeppelins? Most people are familiar with the Hindenburg incident in 1937 when the Hydrogen filled airship exploded at Lakehurst, New Jersey. The entire vessel with 53 officers, crew and 60 passengers was consumed by fire in just four seconds. But did you know the 236-metre long, Graf Zeppelin was flown for 13,000 hours without incident? Or the original 420 foot Zepplin flew its maiden flight in 1900 on under-powered Daimler engines, and was grounded after just three flights?

I located all that information, along with eight other items charting the history of the Zeppelin, in seconds simply by selecting the word "Zeppelin" in the story on duralumin. This is typical of a *Time Table* tour – and it shows how one item leads to another, and another and another... Any tour you take will go along different routes – because you follow the paths that interest you. Most of the descriptions are short – a few short screens at most – but this is a bonus, because the casual reader never gets bored with the linearity of it all.

The problem with this title is also a credit to its design and the CDTV multimedia engine; once you start experimenting with it you just don't want to stop! This can lead to arguments between the *Coronation Street* addicts (for instance) and the rest of the family who are bent on increasing their knowledge. In itself, the *Time Table of History* defines just what can be done with CDTV and confirms its status as a true multimedia engine; a talking book suitable for all. This title is an essential purchase for your CTDV or A690 – just leave yourself plenty of time to browse.

WORLD VISTA

Personally, I have always found Geography a rather dry subject, so it was with dubious anticipation that I greeted *World Vista* – an interactive atlas. On the face of things, *World Vista* promises a lot: full colour maps from over 200 countries, samples of the language, pictures from many places of interest and a lot more. Here are some of the facilities it offers:

● Speech: Would you know how to greet a Japanese or ask where the toilet is in Hebrew? These are the sort of questions *World Vista* can answer. Many languages are covered, but just over 20 identical phrases are given for each one. These range from "Yes" and "No" to "My name is...". This last is interesting, because the narrator gives their name as part of the description: so you might end up saying to a German, "My name is Egon Schmidt Mark Smiddy." Sounds daft, I know – but is your German/Hebrew/Japanese up to deciding which part of the phrase is part of the language?

● Images: The occasional browser will be fascinated by this section of the work. Hundreds of images digitised in high-resolution colour from the Photri Inc. library provide hours-worth of occasional browsing. For me, this is without doubt the best part of *World Vista* – being able to see places I'll probably never get a chance to visit.

● Music: In accordance with the best traditions of multimedia – *World Vista* proves it is possible to get an atlas to sing to you. Most countries are accompanied by a snippet of traditional folk singing. (You know, the one where the Englishman gets up, sticks a finger in one ear and wails out of tune to get people to buy more beer.) Each snippet has a short description telling who or what the song typifies about a country's culture. Like the speech though, the music is sampled and suffers from high-frequency hiss.

● Maps: It seems amazing that an atlas of the world should choose to include a city map of Liverpool in its barrage of information – but *World Vista* does. In fact, only two UK cities are included in this title, London being the other (and with all due respect to the scousers) it seems odd the compilers omitted Edinburgh. Worse still, this so-called Liverpool city map actually covers the area as far off as Wigan and Warrington. Each of the detail maps are actually low-resolution digitised from a series of relief maps copyright Rand McNally & Co from 1980 which probably means a lot are out of date. Each one covers about four screens-worth of information which can be scrolled at will. The trackball would seem to be the ideal tool for this, but in fact it tends to make matters worse.



World Vista is an interactive atlas with information on speech, music, geography and facts relating to over 200 countries. The disc brings faraway lands to your own living room...

● Facts: There are a lot of them! From the average life expectancy of males and females to a country's exports and gross national product. This section is the best organised because it allows you to cross reference countries with similar statistics or details. For instance, a woman in the UK can expect to live to 77 on average – the same as a woman in New Zealand, Belgium or Austria. Perhaps she should move to Andorra and get the extra four years women enjoy on average there.

World Vista is an early example of CDTV software though that should not be taken as an excuse. True, it contains a mass of information as you should expect from a CD title, but some of that information has been compiled in a rather devil-may-care fashion. For instance, since when has the UK's highest peak been called "Nevis, Ben"? Some may argue this is a more realistic way to index such facts, but there is no excuse for this appearing in the main text. The speech samples (played using Amiga audio I suspect) and maps are poor but the still graphics are quite respectable. This atlas on CD, while not a brilliant piece of interactive multimedia (mine had a nasty habit of crashing) is a very interesting resource for students of geography and is certainly worth a look – but get a good demonstration before parting with some cash.

GUINNESS DISC OF RECORDS

Guinness is Irish and its famous *Book of Records* is most certainly a great achievement in itself. Strange to reflect that the superlative CDTV version of the book is produced in the UK yet narrated by Americans. You could be forgiven for thinking the *Guinness Disc of Records* is therefore an all-American thing. Not so; it contains the entire contents of the 1991 *Guinness Book of Records* complete with pictures, facts and fascinating narrated tours. Most notably, it was the only title to recognise the Joy/Mouse error and gave instructions to correct it. This button on the remote handset affects how the CDTV responds to remote control and confuses a lot of titles. Also, it was the only title with a screen blanker. Two little touches which illustrate that a lot of thought has gone into the programming of

continued on page 21

SHOPPING LIST

World Vista £54.99
Produced by:
Applied Optical Media Corp
18 Great Valley Parkway,
Malvern, PA 19355

CHECKOUT
WORLD VISTA

Graphics ●●●○○
Images are beautiful, digitised maps are poor.

Sound ●●●○○
Plenty of samples but that's what they sound like too.

Ease of Use ●●●○○
OK with the controller, useless with a trackball.

Performance ●●●●○
A lot of disc access even for simple operations.

Value ●●●●○
Truly a massive amount of information – but pricey.

Overall rating ●●●○○

A nice idea but it could have been much better.

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continued from page 19

this title.

But this disc is all about records: For instance, did you know the largest scorpions in the world measure seven inches long, yet the smallest measures only half an inch? Or that the Cray 2 is capable of 250 million floating point operations per-second? Or the largest recorded meteorite weighs an estimated 65 tons? Or that Dave Gauder pulled Concorde 40 feet with his teeth. Or even that a snail was revived after being stored in a museum display case for four years? If that sort of information was all this disc was about it would be useful – but there's more. The tour and picture chapters.

● Pictures: In this section, records are arranged by pictures. For example, the strongest animal is (apparently) a Rhinoceros beetle which is capable of supporting 850 times its own weight! Typically all the pictures are digitised in glorious HAM from photographs (although a few are cartoon and composite illustrations). At any time, you can move from the picture to some descriptive text and back again, or just move through the pictures until you find something curious.

● Tours: This section is without doubt the best part of the disc when it comes to demonstrating just what the CDTV can do. Each tour (there are six in all) is a complete audio/visual presentation of the relevant subject. Although the tours are automated rather than interactive, they combine all music, graphics, pictures and sound together with a narrated sound-track. And each one is several minutes long: Record Breakers spans over three and a half minutes; and Human World is almost five minutes long. Anyone wanting a real demonstration of CDTV should take a look at this section; it's a real treat.

For the insatiably curious, the disc is indexed by subject too. Unlike a classic index, the subjects are listed by record type: fastest, best, worst, etc. In some circumstances this leads to another sub-index to narrow down the search. It's a little tricky to use at first, but quite logical once you get used it it.

The *Guinness Disc of Records* may not be everyone's cup of tea since it doesn't really fit into any convenient pigeon-hole. I suppose it is best regarded as an educational title: although it only covers the best, fastest, slowest, biggest etc. it provides a fascinating and entertaining insight into fields as diverse as human achievement and the mysteries of space and time. It is also a fantastic taster of what can be achieved with the CDTV and is a credit to its producers; and for that reason alone, it deserves a place in everyone's CD collection.

SHOPPING LIST

Guinness Disc of Records £34.99
Produced by: New Media
12 Oval Road
London NW1 7DH

CHECKOUT GUINNESS DISC OF RECORDS

Graphics ●●●●○
Excellent quality images and lots of them.

Sound ●●●○○
Superb music, narration and effects but limited to tours.

Ease of Use ●●●○○
Scroll and page arrows could be simpler.

Performance ●●●○○
A little slow compared to others.

Price Value ●●●●○
Limited interest but great stuff nevertheless.

Overall rating ●●●○○

Don't be put off by the score – just take a look.

JAPAN WORLD

The *Japan World* project has been on the go for at least 12 months and started life when a major Japanese manufacturer set up business in Derbyshire. The local council, chief educationalists and others including Fuji film and Japan Airlines got together with the idea to create a multimedia presentation and learning package to help people understand Japan, its language and rich culture.

Culture is very important to the Japanese; even a slight mistake in ritual could give great offence. If you happen to be on a business trip to Japan and a very important official asks you to take tea with him, would you know how to hold the cup? Sounds trivial, but in Japan such things are surrounded in great mystique and the correct use of protocol is essential at all times. As you move around the programme, your guide pops up from time-to-time with snatches of digitised speech and spot animations. Many photos can be accessed upon demand too.



***Japan World* – everything you've ever wanted to know about the Japanese and their culture. It's an interesting idea, although perhaps a little limited in use. There's even a test section to find out how good a student you are**

The programme also contains some amazing historical facts too. For instance, the Kofun period (300 to 700 AD) takes its name from the word Kofun or Tomb because many large tombs were constructed during that time. Japan can also claim the largest tomb in the world. Located near Osaka and measuring 470 metres long and 4km around its perimeter, it is the reputed resting place of the Emperor Nintoku.

A major part of *Japan World* is its ability to test the viewer's knowledge and understanding of the subject. Various tests are employed, usually following a multiple choice system – all involve and enhance learning and better understanding of the language and culture. In school this may be of limited use, but in higher education and as resource material it is invaluable. The section on the written language includes spoken samples of each "letter" in the Hirigana and animated examples of how each should be formed. Wonderful stuff.

The *Japan World* programme is not for everyone – it was designed for a purpose and it does its job very well. If I had to find fault (and as a reviewer that's my job) it would be with the graphics. Although most of the drawn pictures are fine, many of the still images look as if they were taken with a Kodak Brownie. Nevertheless, this should not be taken as a major flaw in what amounts to an excellent package.

CONCLUSION

This has merely been a quick tour of some of the better CDTV titles around – but I hope it has given you a taste of what the CDTV or an Amiga and A690 (when it arrives later in the year) are capable of. In compiling this article I have discovered what a feast of information and almost endless possibilities the CDTV offers.

Multimedia? The hype-makers can stick that one up their olfactory tract. In the 12 months or so since it appeared, CDTV has proved talking books and CD programmes are the way forward. Although they are without doubt excellent home machines, I'd like to see them in public libraries and schools because they allow *anyone* access to the information they require quickly and far more easily than ploughing through volumes of information; as the titles covered here prove. I have seen the future of education: its name is Commodore Dynamic Total Vision. AS

SHOPPING LIST

Japan World £49.99
Manufactured by:
Global Learning Systems
Lonsdale House
Lodge Lane
Derby
Derbyshire DE1 3HB

CHECKOUT JAPAN WORLD

Graphics ●●●●○
Animations are excellent – digitised images not so hot.

Sound ●●●○○
Limited – but what there is is acceptable.

Ease of Use ●●●○○
Not immediately easy – logical once mastered.

Performance ●●●○○
No slouch, but it could have been faster.

Price Value ●●●●○
Expensive – but par for product with limited appeal.

Overall rating ●●●●○

Well worth it if only for the animations.

Techni-coloured dream card

Phil South heralds the arrival of the new Harlequin 32-bit graphics card



"This month I've got hold of Harlequin graphics card. With 16 million colours to choose from, Amiga animation can finally come out of the shade."

Phil South

One of the drawbacks of the Amiga is the lack of a true colour standard, that is, a display which provides 16 million colours. Since the Amiga is renowned for its graphics capability, this is a problem. The lack of a good 24-bit standard was until recently holding the Amiga back from the professional world.

24-BIT EVOLUTION

We know that the world and his mate want some kind of 24-bit solution, and that there are suppliers out there willing to sell them something. The HAM-E (Black Belt Systems) and DCTV (Digital Creations) offer the low end support. These have the ability to read and write 24-bit files, but their displays provide less than the 16 million colours of 24-bit boards.

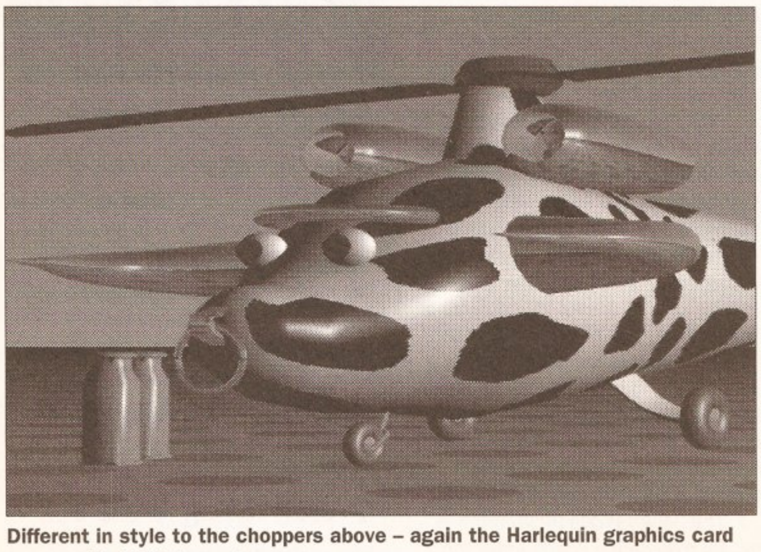
Items like the NewTek Video Toaster have shown that the Amiga is able to compete in the professional world of video and that 24-bit on the Amiga is as good as 24-bit on anything else. What was needed was a good British product – namely the Harlequin.

The Harlequin was the first British 24-bit (strictly speaking 32-bit, with a 24-bit display and a further 8-bit overlay) Amiga product announced. It's now on sale in quantity, and although the price is a little too rich for most people's blood, the professional market is said to be lapping it up.

IT'S IN THE BOX

When you open the box you're presented with a well produced 32-bit graphics card, a copy of *TV Paint* (a 24-bit graphics paint package), *RasterLink* (a file exchange program), plus some demo screens for you to load up. As well as this you have a disk containing the *HUser* program, which sets up the Harlequin's resolution and other settings, and also provides some test screens for you to load while you get set up.

The card itself is a two layer affair with a flying lead going to the back of it, to which you have to connect an external monitor to view the output from the Harlequin. There are four versions of the card, the only difference being the amount of memory on the card itself. Obviously the more memory you have the more graphics you can pump into your card, and with the larger models "double buffering" becomes possible for loading two pictures at once.



Different in style to the choppers above – again the Harlequin graphics card comes off with flying colours

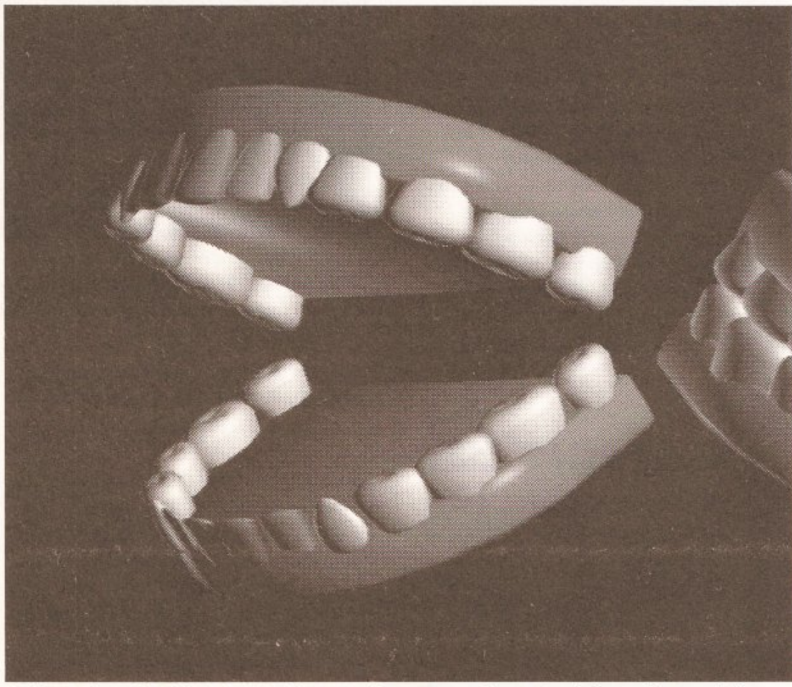
SETTING IT ALL UP

Putting the Harlequin into the Amiga is straightforward. Once the card is in, you connect an external monitor to the feed at the back of the computer, where the socket from the Harlequin pokes out. I was supplied two leads; one for the Sony tubed Citizen multisync which I have on loan from Citizen, and another for the standard Philips 8833 that I own. For reasons I'll explain, I used the board with the Citizen multisync, running my Amiga screens and the Philips RGB taking the output from the card.

RUNNING HUSER

Once the equipment was all set up, I booted the *HUser* program to set the preferences for the card. This is a simple program which, through a series of buttons, takes you through the various parameters of the card and lets you choose which ones you need.

The instruction manuals tell you which parameters to set initially, as there's a bewildering range of choices, and this will get you set up. If the *HUser* program works, then the card is set up properly, and you can check this by putting a few test cards on your Harlequin screen. There are the usual colour bars, which are softly graduated from dark to light colours, and a monochrome test pattern too. Once *HUser* has been run, the card is set up and you can begin to use it.



Amiga animation bites back. You may have seen these teeth in action on ITV during the early hours of the morning advertising 0898 numbers!

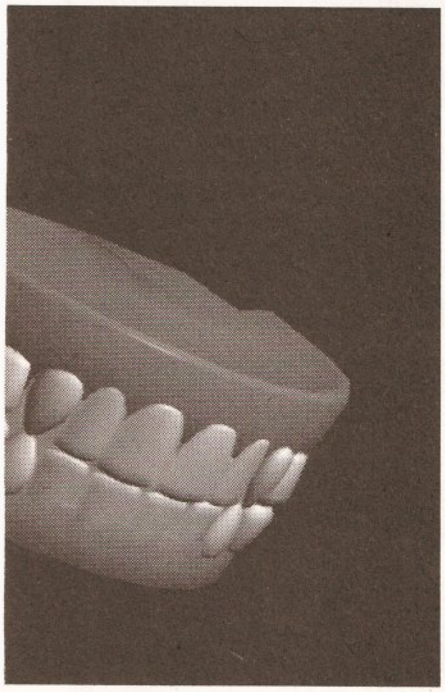
REAL TIME PAINTING

The main drawback of a 24-bit (or even a 32-bit) card is that although it promises high quality graphics, you can't create any graphics on it in real time. This is not so on the Harlequin. What was needed was a good and fast real time paint package, and *TV Paint* looks like being just that.

It's the best thing to hit the Harlequin in a long time, and it's a full 24-bit paint program written specially for ACS by TecSoft of France. Although previous versions of this software have been judged a little flaky and buggy, the newer versions of the software going out with the Harlequin are said to be more stable and bug free. As the program seems to be updated almost every week at the time of

writing, it's impossible for me to review the latest version. But I have seen later versions and they seem to be more reliable than my version.

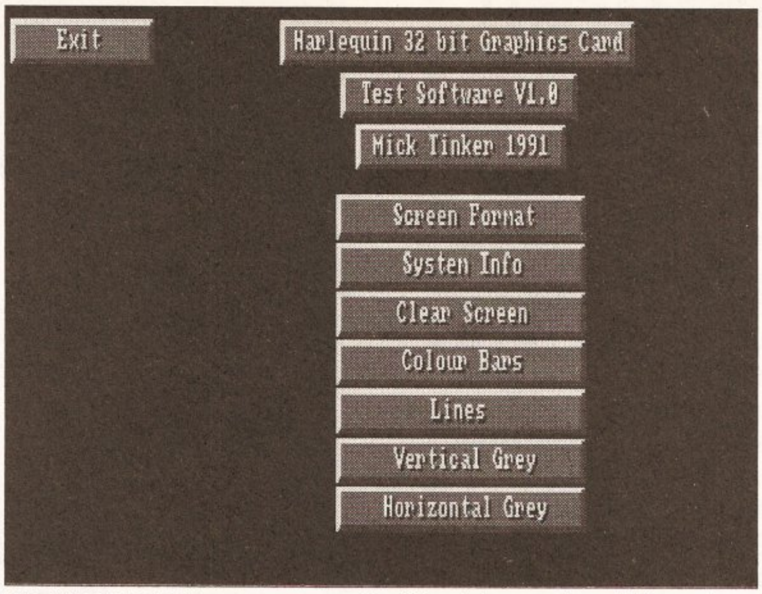
TV Paint is a 24-bit image creation and processing software package, enabling you to load and edit IFF 24-bit ILBM files as well as 24-bit files from other graphics machines such as the Targa, DEEP, and Caligari RENDITION formats. To perform image processing and other editing of 24-bit files in real time, the program and the Harlequin it drives must be inside an accelerated Amiga ie, an Amiga 2000 with a 68030 chip or an Amiga 3000. In order to function the program needs at least 8Mb of memory! This seems like a lot, except when you consider that the average image size is at least 1.5Mb. (And to think there was a time when 256K was a lot of memory!)



The proud boast of *TV Paint* is that it's a program designed by an artist *for* artists. This much is clear from the program's features, and the ease with which they are executed. The actual word the manual uses is "graphists," which is, I suppose, what you get for translating a manual from French to English yourself rather than calling in a professional. So you could say it's a program for artists, translated by programmers.

I should add that, apart from the odd mistranslation, it's a good manual, although the thing looks laser printed and for the asking price you'd have thought full colour might have been more appropriate.

The program comes on an absolute *pile* of disks, and a dongle (security device) to prevent anyone just copying the program, albeit a little fruitless if they did considering the outlay in memory and monitors needed to drive the program.



The *HUser* program's menu screen – the *HUser* takes you through the various choices you can make when setting the card's parameters

Once you run the program the Harlequin screen bursts into life, whereupon you have all the colours of the rainbow in 24-bit. The quality is quite stunning and fast, but then you do have to have an 030 card to run it, so not a big surprise. Screen refresh isn't too slow, but if you've been used to the normal 8-12-bit graphics it will seem a bit slow.

But the quality of display is what gets you in the end. Try the airbrush, and what you get is a smooth spray of colour, like a real airbrush full of light! Quite a change from the usual blocky sprays of colour you get at regular Amiga resolutions. Other features have been carried over from regular graphics programs such as *DigiPaint* – for example "rub through", where you have one picture over another and rub it through so you can see the picture underneath. Edge transparency is another excellent feature, which enables brushes clipped from one part of an artwork to be pasted in smoothly in another position. You can also colourise, alter the density, shade and sharpness and antialias your image beyond recognition. Some of the tools are a bit less for the artist and more for the programmer. For example have you *ever* used a "ray" tool in you life? (You know the tools which draw lots of lines out from a common centre.) Will you ever use such a tool? Why do people put these tools in their art programs then? Beats the hell out of me!

Obviously, apart from the creation of original artwork, this system opens itself up to be used as a treatment station for photographic images which have been scanned in. Many bureaus offer this service, taking a photo or slide which you send them and making a 24-bit graphics file. Once on disk it's yours to transform in many exciting ways.

TV Paint is the only 24-bit program to enable you to work in 24-bit on screen in real time, and that's got to be worth the money.

RASTERLINK REVAMP

This is a piece of software (formerly called *ImageLink*) written by Active Circuits Inc, which enables you to take one type of graphics file and make another, quickly and simply. This new version permits direct conversion, not in this case to a file on disk, but to a buffer in the Harlequin. What you're doing is writing the file to the screen in Harlequin format instead of a graphics file format to disk. This is handy for displaying screens on the card as well as chopping other 24-bit files for use in DTP etc from alien formats. I've used *Imagelink* before now, and this program is much more solid and reliable, and produces more faithful formats, especially when writing *to* an alien format, especially for a different machine like the PC or the Mac.

TO SUM IT ALL UP

The 24-bit revolution won't really have arrived until the Workbench itself is a 24-bit operation, so that the same display is used for text and everything else, without the need for an add-on board and screen for video work. It does bother me that it takes something like the Harlequin to be invented when the Amiga should feature these kind of graphics as a matter of course, if the spec was moving at the same speed as other developments. I suppose you can't have everything.

Important programs to feature direct Harlequin support, are *Art Dept Professional 2* by ASDG and *Real 3D* (Activa), although any 24-bit file can be converted and sent to the card via RasterLink. The teeth and helicopter images on these pages were in fact created with *Imagine*, loaded as 24-bit images and then displayed courtesy of the Harlequin board.

So all things considered the Harlequin is a very tasty piece of kit, and I wouldn't hesitate to recommend it to anyone wishing to go into 24-bit graphics or desktop video. The quality is up there with the professional workstations, and yet you can pick up the whole caboodle for about £1500. AS

SHOPPING LIST

Harlequin 32-bit card
1500 (1.5Mb) £1286.63
2000 (2.0Mb) £1404.13
3000 (3.0Mb) £1521.63
4000 (4.0Mb) £1639.13
by Amiga Centre Scotland
4 Hart Street Lane
Edinburgh
Scotland EH1 3RN
☎ 031 557 4242

CHECKOUT HARLEQUIN

Output ●●●●●
The full 32-bit output looks lovely, even in interlace on a Philips 8833. Video output is possible for single frame animation. 16 million colours are as many colours as you'll ever need.

Speed ●●●●●
Modestly fast considering the amount of graphics being moved around. Redrawing a screen only takes a minute or so, and with an accelerator the process is even faster.

Documentation ●●●○○
Fairly good, although perhaps *TV Paint* could do with a more jazzy manual.

Price Value ●●●●○
Expensive by beginners' standards.

Compatability ●●●○○
Via *RasterLink* the board can display pictures from all manner of 24-bit sources, and direct support is available from a number of significant Amiga graphics programs.

Graphics Handling ●●●●●
Nothing short of excellent, especially using *TV Paint*, as you can create and display artwork previously reserved for £70,000 graphics workstations. Totally professional quality, and no mistake.

Overall rating ●●●●●

What we have here is the standard PAL frame buffer by which others will be judged. Although many more will come into the market under this price, few will match its spec and quality. My only hope is that more mainstream 24-bit software will come along soon, as promised..

Price Busters!!

Graphics & General

Advantage....64.99
Art Department Pro 2....139.99
Broadcast Titler 2....169.99
Colourburst....479.99
Deluxe Paint IV....54.99
Digipaint III....34.99
Disney Animation Studio....64.99
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The rugged look – created courtesy of the fourth recursion level on G*enesis.* Compare this with the picture below right: you'll see that the higher the level, the more finely tuned the fractal pattern becomes

The New World Generation

Fractals have come a long way since their days forming snow-flakes, dragons and paisley patterns. Alison Harper takes a look at Genesis the Third Day and joins up with the fractal generation

A long time ago, in a galaxy far away, a chain of nuclear events led to the birth of the Earth. In those terms creation seems simple, but it's far more complex than that...

Since man appeared on the Earth, he's pondered over the magic of creation, developing mystical theories hoping to understand. Eighteenth century philosophy tried to rationalise creation with the edict that there is no effect without cause. They were not far wrong...

FRACTAL POWER

At the beginning of this century a branch of mathematics known as fractals was identified. It has since been found that fractals are an effective way of simulating nature.

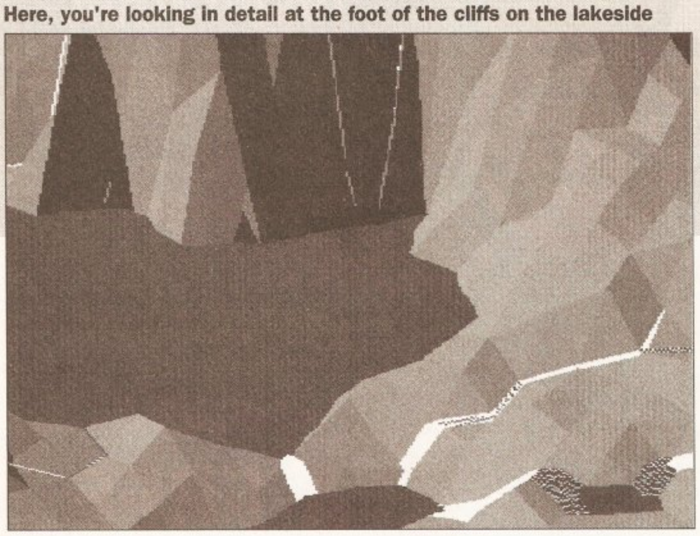
Fractals can create a 'natural' effect. They mimic a chain of being – they start from a 'seed', grow and change. All this seems random, as in nature; it is in fact determined – remember every cause has its effect. *Genesis the Third Day* works with fractals, creating landscapes in 3D.

GENESIS THE THIRD DAY

With *Genesis* you have the power to create your own worlds, view them from any angle, height or distance and zoom in on any special features such as lakes, valleys, waterfalls or meandering rivers.

Genesis is fairly simple to use. Once installed, you control your design by means of self-explanatory functions on pulldown menus and pop-up requesters. the manual also gives a guide to keyboard shortcuts.

Another facility is the graphical obvserver view. You can fix your view point in relation to the landscape at any distance, height or angle. Here, you're looking in detail at the foot of the cliffs on the lakeside

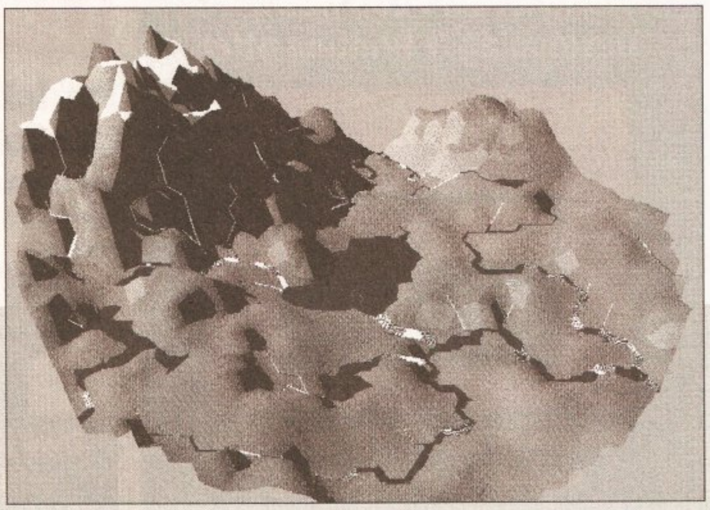


SOWING THE SEEDS

The first choice you have to make when creating a new landscape is to pick a 'seed' for random numbers. This number will dictate the sequence of random numbers which later determines the meandering of rivers or heights of the landscapes.

Any number can be entered – it is best to experiment until you find a landscape you feel you'd like to work on. As I've little imagination when it comes to picking numbers from the air, I tried the serial number from my Harry Connick Jr album and my date of birth. As luck would have it, these turned out to be quite effective...

Next you are required to specify a spring probability. This is largely a matter of taste – are you looking to create a water-logged landscape or not? Again you have to try it all out for yourself when you're starting out. I preferred to err on the side of caution and chose a probability of 0.5 to start with.



The same landscape as above left. Here though it's drawn at the third recursion level. This gives a more undulating landscape as it is made up of fewer points and triangles

SPRINGING INTO ACTION

Genesis now jumps into action to calculate the landscape as it stands at recursion level 1. At this point a simple wireframe is displayed which consists of 19 points and 24 triangles. This formation is the basis of your future landscape – but don't worry if it's not what you were hoping for, you can still alter the shape of things to come. The height of any of the points on the wireframe can be altered simply by clicking and dragging with your mouse.

When you're happy, click on OK. You can then locate springs. As is the case throughout *Genesis*, you can always plump for the default option. As ever you have total control. Whatever you decide it would be wise to point out that more springs means more rivers which add to your landscape's individuality.

ON THE LEVEL

You can at this stage draw a picture of your landscape. However if you do so at recursion level 1, you'll find a blocky representation of what a land-scape is supposed to be. For a scene which takes on a more realistic shape, you need to increase the recursion level to at least 3.

Recursion in simple terms is the repetition and sub-repetition of an idea. Thus, in *Genesis*, with each

increase in level, the landscape becomes more finely defined by an increase in the points and small triangles making up the landscape. At *Genesis*' maximum recursion level (level 5) up to 118099 points, 23600 triangles, 1,200 springs and 2,000 lakes can be supported.

The big limitation here is the memory used to store the

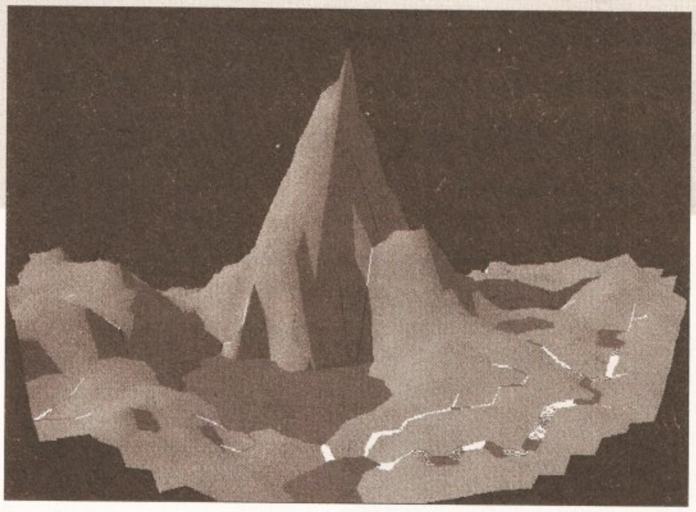
customise your picture's colours. By clicking on the right mouse button, you'll see two menus – Project and Color. Choose Color... Although it's the least technical of all the functions, it has a stunning effect on the look of your lamdscape.

It's quite amazing what a few simple colour changes can make. You have the option of changing the



The observer view in use. Here a landscape has been zoomed in on from the side. With such possibilities, *Genesis* enables you to create a wide range of landscapes from just one set of fractal data

At the peak of perfection – Genesis gives you free reign to alter your design at any stage of its creation. Abstract landscapes form the basis of a scene which is out of this world...



landscape's data and the time taken for your Amiga to draw a new landscape on a higher level. It can take hours rather than minutes, particularly so if you have a large number of lakes to be 'filled'. This was a problem working on an A500 Plus. While 1Mb RAM is sufficient to use *Genesis*, problems will arise on occasion at level 4 and there's not a hope of reaching level 5 – 2Mb and a lot of patience are recommended.If memory management turns out to be a problem, the manual supplied with *Genesis* does give some useful tips.

COLOUR AND SPICE

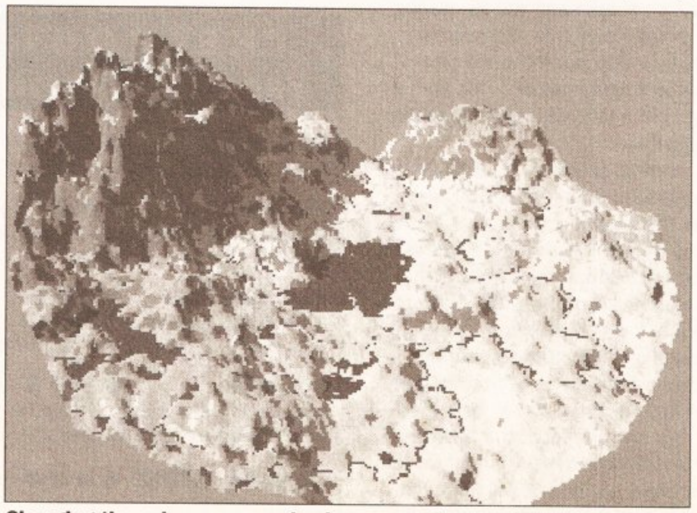
There's hours more fun to be had once the landscape is drawn. Here colours of contours, cliffs, sky, shadows and water. By altering the RGB colour slide scale, your landscape can take on the appearance of a volcanic island, an Alpine, Martian or desert landscape. Red rivers, a dark sky and dark cliffs could mean a volcanic landscape. Surrealist tendencies are also catered for!

Colour adds life and character to your landscape, but why stop there? You can alter the sun's angle to cast varying shadows over the landscape to create just the right atmosphere.

SAVE THE WORLD

With *Genesis*, your fractal creations are easily saved out to disk in IFF or HAM format, whichever you prefer, by choosing the appropriate command form the Project menu. Individual picture files can be saved for animation and can be combined with or altered by an art package.

There's always another option if you wish to continue work on your landscape at a later date: data can be saved to reconstruct the fractal scene you were working on.



Changing the colours on your landscape can have a dramatic effect. Here, snow was added to the contours by colouring them white and the cliff faces were lightened to create an Arctic landscape

AND THERE'S MORE

Anything you could wish to adjust has this potential. There are numerous facilities for those into animation. There are varying degrees of overscan and script commands are possible for drawing a series of pictures eg from dawn to dusk. Object files can be created to import landscapes into animation and 3D modelling programs like *Turbo Silver 3*, *Sculpt 3D* and *Videoscape 2* and the like.

The *Genesis* package comes with a manual which is comprehensive in its coverage, although somewhat haphazard in contents. The Hints and Tips section comes somewhere in the middle of the manual: it would have made a handy appendix.

If you get stuck, *Genesis* comes with a second disk called "Data-Disk". This has some pre-drawn landscapes to load into *Genesis* to see what can be achieved.

Also included in the package is *DEM2GEN* which has been created from USGS Digital Elevation Model data. This enables you to fly over points of interest in the US, on the moon and Mars. You can cover up to 400 square miles.

CONCLUSION

There's an argument for saying that *Genesis* is an expensive executive toy, nevertheless it's addictive and you'll certainly get hours of use from the software. Creating new and more appealing landscapes will be an ongoing challenge for the true perfectionist. Hours can be passed twiddling the options open to you. Maybe you didn't like the lakeside screen and would have preferred your fractals to work on a canyon.

Animation is the main attraction of *Genesis*. Using ARexx macros or picture scripts, series of pictures can be brought to life.

As a newcomer to fractals, I was amazed by what *Genesis* had to offer. Thanks to the power of fractals and *Genesis*, you can let your creativity loose – go on there's a whole new world out there. AS

SHOPPING LIST

Genesis the Third Day £49.95
by Microillusions Software
distributed by: Software Business Ltd
Brooklands, New Road
St Ives, Cambridgeshire
PE17 4BG
☎ 0480 496497

CHECKOUT
GENESIS

Ease of Use ●●●○○
Wide range of easy to use controls. Mastering the observer view to zoom in can be on the tricky side though..

Speed ●●○○○
Lamentably slow at the higher levels.

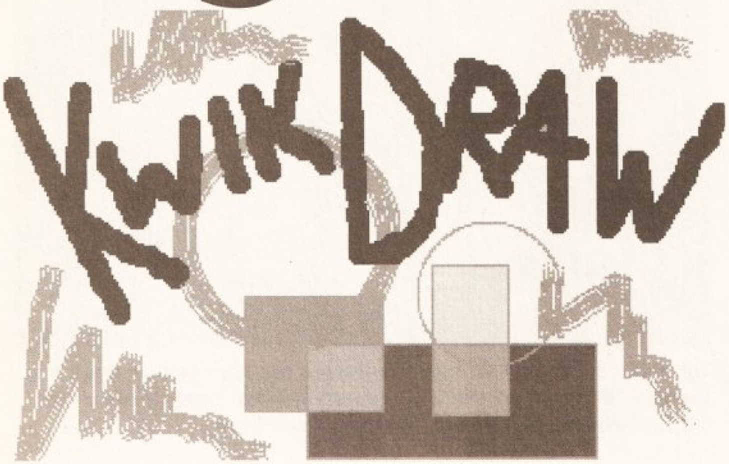
Output ●●●●○
Devises striking landscapes at the touch of a few buttons. It can be frustrating if you're aiming for a definite idea.

Documentation ●●●○○
Rather haphazard in content, it contains everything you need to operate *Genesis*.

Overall rating ●●●●○

Genesis is great value considering its potential. Addictive enough for the casual fractal investigator.

Mightier than the Mouse



Deluxe Paint it may not be, but Trojan's KwikDraw adequately shows what the lightpen is capable of

Having problems with your Amiga mouse? If so, then Trojan's new lightpen could be for you. Jason Holborn takes a look at what it has to offer

Lightpens used to be trendy back in the early eighties, but the dominance of the mouse has reduced their appeal tremendously. But for education and graphics work, the lightpen still has a lot to offer. Is the pen mightier than the mouse?

Using a mouse is something that doesn't come naturally to most – if it wasn't for Xerox Research Laboratories, we'd probably still be using lightpens. The lightpen provides a more natural method of controlling a computer which is closer to the pens, pencils and crayons we were taught to use at school. Instead of drawing on paper though, you point the lightpen at the screen as if it were your canvas.

The lightpen does not leave any marks, so you don't have to clean the screen each time you use it. Instead, the lightpen contains a sensor enabling the computer to tell where on the screen you are pointing. Using a paint package, for example, the computer then provides the ink for your electronic crayon.

MOUSE SUBSTITUTE

Hoping to fill a gap in the market, Trojan has released its Amiga lightpen. This connects to your Amiga via a cable which plugs into joystick port 2 (the one that gameplayers use!). Modelled in a shade of grey, the styling of the pen leaves a lot to be desired. I always thought that pens were rounded, but Trojan seem to have got some idea into their heads that a square pen is better – Have they heard of ergonomics? In use, the pen is a little uncomfortable at first, but you soon get used to it.

The pen is designed to emulate the operations of the Amiga mouse, hence the presence of two buttons at the base of the unit. These take the place of the two mouse buttons, enabling you to access pulldown menus and select without having to go back to your mouse. These buttons have a very positive feel to them, which certainly helps when using the pen with paint packages.

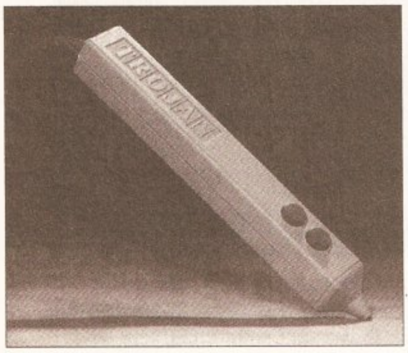
PEN PATCH

Supplied with the pen are two disks – one for those who don't have Workbench 2.0 and another for those lucky A3000 and A500 Plus owners. That second disk is quite a new addition, as the first batch of lightpens only went out with the 1.3 driver software. To the despair of users and Trojan alike, the driver didn't work under 2.0, so the company had to throw in an updated driver for 2.0 users. You may find some shops still have old stocks of the 1.3-only lightpen, so check that the pen you buy comes with a 2.0-compatible driver before you hand over hard earned cash.

Once installed, you line up the onscreen pointer with the lightpen's point. This is achieved by placing the pen on the screen and moving the pointer using the right Amiga and cursor keys until they match up. Then you're ready to scrawl all over your screen. The pen works best with a monitor, but it works fine with a TV as well (don't worry, I did test this!).

The lightpen driver software is a clever piece of coding. Once installed, the Amiga is tricked into thinking that you're using a mouse, so any program which runs under Intuition works with the pen. I tested it with various programs including *Deluxe Paint 3* & *4*, *Professional Page 2.1*, *ShowMaker* and was surprised to find that the pen worked.

Trojan includes its own paint package called *KwikDraw* , but it's a rather feeble program which is by no means competition for *DPaint*. Treat it as nothing more than a tester and you won't be disappointed!



It's not the ergonomic design you'd expect, but it's still comfortable to use. The two buttons at the base of the lightpen are the two 'mouse' buttons

PEN PROBLEMS

Sounds perfect? Unfortunately things aren't as clear cut as they first appear. For starters, as all lightpens work by detecting the raster position, the pen doesn't like dark colours one bit. if you have a large area of black on screen and you try moving the pointer over this, the pointer gets lost until you move the pen back to a lighter region. This isn't a fault, but a limitation with lightpens in general.

Another problem I found was that the lightpen doesn't have anywhere near the resolution of a good mouse. If you try and freeze the pointer in a single position, it hops around the surrounding 4 pixels or so. This isn't too much of a problem if you're clicking on large gadgets, but try painting a detailed picture with the pen and you'll get rather frustrated.

For some reason, the lightpen driver software doesn't seem to like interlaced screens. It will work with an interlaced program, but the lightpen driver software seems to interfere with the way interlaced screens are drawn by the Amiga, rendering the display rather unreadable.

TO SUM IT ALL UP

I am impressed by Trojan's lightpen. It's not fair to put it down because of problems you'll find with all lightpens. This serves to demonstrate why the mouse has become so popular. That problem with interlaced screens needs to be sorted out, but apart from this minor gripe, the pen performed faultlessly.

If you have children or find a lightpen preferable to a mouse, then I can recommend this. I've used a few lightpens, but Trojan's is by far the best I have encountered. AS

SHOPPING LIST

Trojan Lightpen £39.99
by Trojan Products
Unit 7, Dafen Park, Llanelli,
Dyfed Wales SA14 8LX
☎ 0554 777993

CHECKOUT
TROJAN LIGHTPEN

Ease of Use ●●●●○
What is more natural than using a pen?

Features ●●●○○
Poor ergonomic design aside, the lightpen has all the features you'd expect.

Documentation ●●●●○
Rather thin but everything you need to know is in there, which is all that matters.

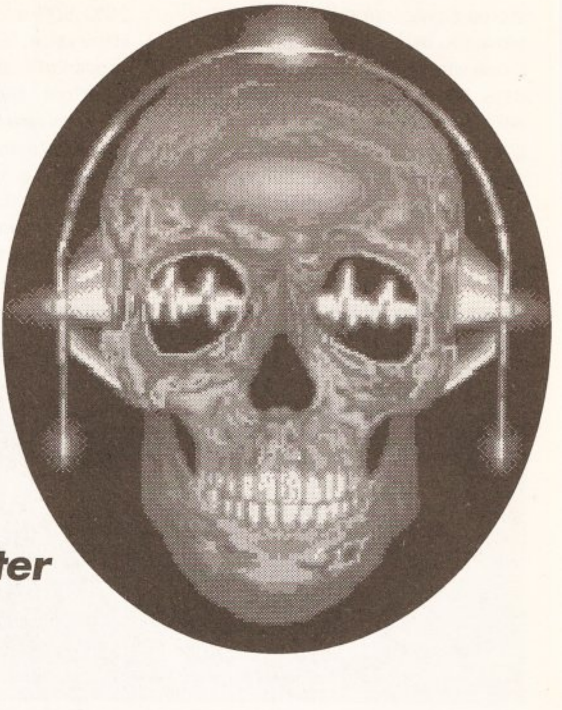
Operation ●●●●○
What spoils the operation is driver software interference with interlaced screens.

Overall rating ●●●●○

The Trojan Lighpen not only fills a gap in the market, but fills it well.

S-S-Stereo Master

Having done very nicely out of Master Sound, MicroDeal has upgraded its budget sampler to make it even better than before. Jason Holborn grabbed a sample



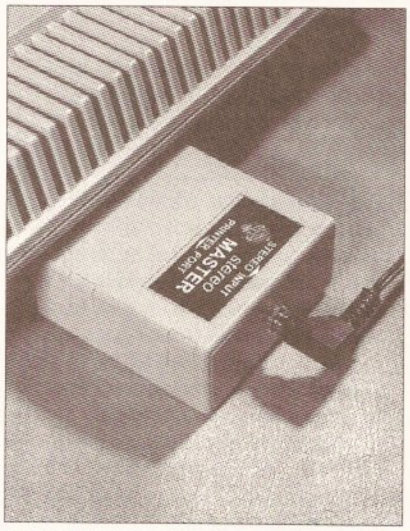
When MicroDeal launched its MasterSound sampler way back in 1989, it heralded a new age in Amiga samplers. Back then samplers were terribly expensive things, but the low price of MasterSound finally gave the average user the chance to experiment with the fascinating world of sound sampling. Within weeks it outsold virtually every other sampler on the market, laying the foundations for a flood of other budget samplers soon to fill the marketplace.

These days MasterSound is no longer the market leader it was. With better (and often cheaper) derivatives now available (eg New Dimensions TechnoSound Turbo), MasterSound has been relegated to the back of the samplers line up. Not wanting to be left behind, MicroDeal is now back on the offensive with the launch of Stereo Master which is effectively MasterSound 2. Boasting everything the competition has to offer with a few tricks of its own, Stereo Master is set to regain the sampling throne for MicroDeal.

HOW BIG IS IT?!

While everyone else was churning out samplers the size of disk drives, MicroDeal was one of the first companies to produce a truly micro-sized sampler. Its original MasterSound set the trend, but it has gone one better with Stereo Master by producing a sampler that is smaller than ever. The casing takes up about 3 square inches of desk space, while the PCB inside is smaller still – 1 by 3 inches. Seeing such a small, yet so capable sampler makes you wonder what other manufacturers are actually up to. If MicroDeal can squeeze so much power on to such a small PCB, why can't the rest?

Stereo Master connects to the Amiga via the parallel port. If you've got a printer, then I'm afraid it'll have to be unplugged whilst Stereo Master is connected, so it's hardly the kind of thing you can plug in and forget. Most samplers share this common problem, although some sampler manufacturers do seem to have got the message by building in parallel port pass-thru connectors, which is a very good idea indeed. Even Omega Projects' budget sampler SoundTrap boasts a pass-thru, so there's simply no excuse for it not being there.



Master Sound – the cheap and cheerful sound sampling facility

Input to Stereo Master is via one of those hideous 3.5 mm stereo jack sockets which I've grown to hate. Most stereo samplers boast at least two separate phono connectors these days, enabling the stereo signal to be fed in via two separate cables, which I feel is a better bet if you're intending to use the sampler for more serious applications. If you're just going to plug the thing into your CD player, then the connector supplied will do the job well enough. Thankfully MicroDeal does include a suitable cable, so you can plug in and go straight away.

S-S-S-STEREEEEOOO!

Stereo Master supports sampling in full stereo. Obviously you'll need a sound source which can output a

PROVIDING THE COMPETITION

Back in the days when MicroDeal launched its original MasterSound, the Amiga samplers market was a considerably less crowded place. These days though, trying to pick the sampler that is right for you is a daunting task for even the most experienced Amiga musician. Here's a quick rundown of Stereo Master's direct competition.

TECHNOSOUND TURBO – Soon to be upgraded to 12-bit or possibly even 16-bit resolution, New Dimensions' TechnoSound Turbo is the yardstick by which other budget samplers are measured. Featuring full stereo sampling with rates of up to 55 KHz, TechnoSound produces some of the cleanest and sharpest samples of any Amiga sampler.

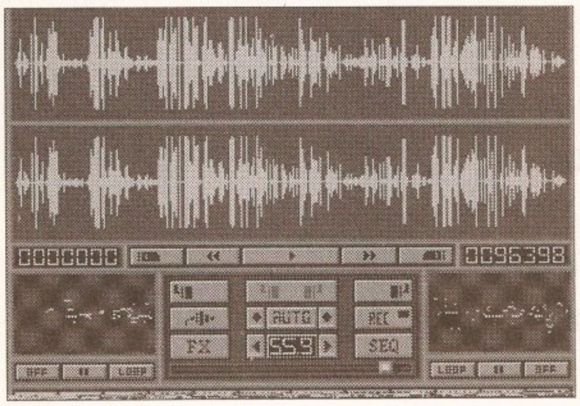
The TechnoSound software is a very polished affair which looks quite similar to the software bundled with Stereo Master. It doesn't come with a sample sequencer like Stereo Master, but its digital effects give Stereo Master more than a run for its money. One nice feature which Stereo Master doesn't have, is the ability to switch between stereo and true mono sampling (ie, all sampling memory is allocated to a single channel).

SOUNDTRAP 3 – Omega Projects' Sound Trap 3 is starting to look a little long in the tooth these days, but it's a good sampler nonetheless. Unlike Stereo Master, it doesn't support stereo sampling, so it's a little limited in this area.

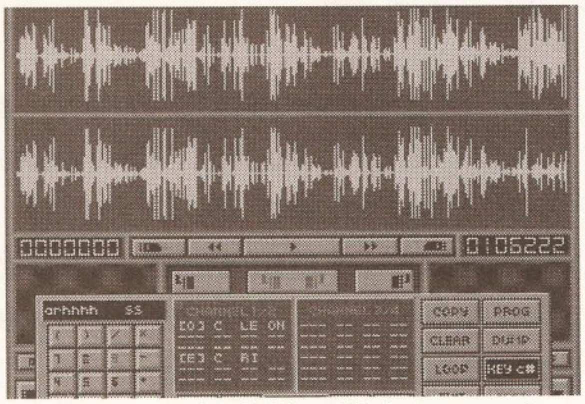
To be fair, SoundTrap was going to have stereo sampling, but designer Bob Lindsay decided against such a feature to ensure that quality of mono sampling was kept as high as possible. As a result, SoundTrap 3 has a very good frequency response indeed. SoundTrap did come with its own sample editing software, but Omega has since scrapped this in favour of the industry standard AudioMaster 3 software.

AMAS – MicroDeal's 'professional' sampler is AMAS, a nifty little 8-bit sampler which boasts both stereo sampling and a full-featured MIDI interface. The sample editing software supplied with the unit fully supports MIDI, allowing you to use the Amiga as a dedicated sampler when it is hooked up to a MIDI interface.

Having owned AMAS for over three years now, I have to say that I'm not that impressed with it. For starters, it only supports sampling rates of up to 29 KHz and the maximum length of any sample is restricted to a paltry 200k (although you can have several 'banks' in memory at once). MicroDeal has recently upgraded AMAS and I'll bring you more on this new release as soon as they send me one for review.



MasterSound owners will instantly recognise the familiar look of Stereo Master's front end



MED it may not be, but the Stereo Master sequencer is a fairly powerful tool nonetheless

stereo signal, but this shouldn't prove too much of a problem. For those who long for the good old days, it can sample in mono, although it doesn't enable you to grab mono samples using all available sample RAM – only one of the two banks assigned to the stereo sampling channels (the available RAM is split between them). This isn't a problem on an expanded machine, but the length of samples is cut ifsampling on a 512k A500.

Stereo Master supports sampling rates of up to 55.9 KHz in mono, although this is halved when you start sampling in stereo. There's no doubting that such a high sample rate produces very clear samples, but it's hardly practical. After all, few music packages support such high sample rates. Even then you'll find yourself running out of RAM rapidly.

The quality of samples is very high – in fact, I'd go so far as to say that they're some of the cleanest samples I've heard from any sampler below the £100 price barrier. It doesn't quite match up to the quality of Audio Engineer, but then Audio Engineer does cost four and a half times the price of Stereo Master!

CLOSE TO THE EDIT

Once you've grabbed a sample, you'll want to clean it up, chopping out the bits you don't want etc. Stereo Master's editing facilities are comprehensive, especially when compared to those in similar samplers. You can carry out the usual cutting, copying and pasting of regions, zooming in and out of the sample etc. What lets these functions down is their speed of execution – even the fairly menial task of cutting out a section of sample seems to take an eternity, especially if you're used to the speed of a program like AudioMaster.

Stereo Master also boasts an impressive selection of specialist sample editing functions including a stereo bounce facility which takes a mono sample and 'bounces' it between the left and right sound channels. You can compress a sample by three fixed amounts – 25%, 50% and 75%. It sounds impressive, but it's just a cut down version of AudioMaster's 'Tune Waveform' function.

Also new to Stereo Master and possibly to Amiga budget samplers in general is a new 3D Fast Fourier display function which plots the frequency content of a sound as a graph. There's no doubting that it looks pretty, but it's just a cosmetic feature. More advanced sampling fanatics may find it useful.

ECHO, ECHO, ECHO...

Prompted by the popularity of the effects section built into TechnoSound Turbo, MicroDeal has built in an effects system which enables you to carry out weird and wonderful realtime transformations on an incoming sound source. Dedicated effects units cost a bomb, so something like SoundMaster's effects section could prove to be useful to amateur musicians. It includes the usual reverb, variable echo and phaser (which is particularly good!), chorus and stereo pan effects which you'd expect, plus a few extras including realtime reverse, pitch bend, ramp pitch up and pitch down. Most give you control, but this is by no means comprehensive.

I must admit that I wasn't totally convinced by Stereo Master's effects section. For my money, I still think that TechnoSound's effects section is far more comprehensive and most certainly more fun. What would have been nice is the ability to apply many of these effects to grabbed samples – then again, even TechnoSound doesn't allow you to do this!

SWEET MUSIC...

Finally, we come to Stereo Master's sequencer section, a fun feature which enables you to create tunes from short snatches of sampled sound. The demo sequence which comes with Stereo Master is impressive, bidding well for the sequencer.It's a simple affair but by no means competition for MED.

Songs can be constructed from up to 18 samples, all of which must be recorded at 14.4 KHz, so you can forget about those nice 55.9 KHz samples now. Recording tunes is a simple process. What you must do is assign each of your 'instruments' to a key on the Amiga keypad and then tap out the tune when the sequencer is put into record mode. You can edit events individually, but even then you don't get a lot of control.

The Stereo Master sequencer is a fun to use addition. It works best with sections of music rather than individual instrument samples, but don't all sample sequencers? The present release seems to group the Amiga sound channels into two stereo tracks (pairs) for editing – wouldn't it have been better if it provided four individual tracks?

A SOUND PURCHASE?

Stereo Master has some rough edges, but it remains one of the best budget samplers. Those used to programs like *Audition 4* and *AudioMaster 3* may hate the editing software, but it's got enough to cancel out these neg-ative points. If you want a cheap and cheerful sampler, try Stereo Master – the sound is top notch and the added effects and sequencer sections reinforce a fine product. Stereo Master comes highly recommended. AS

JARGON BUSTING • JARGON BUSTING

SOUND SAMPLER – A sound sampler is a device which converts an analog signal from a CD player, Walkman etc into a series of numbers which can be manipulated and played back by your computer. The heart of all samplers is an Analog to Digital Converter circuit, the piece of silicon that does the work.

KHZ (Kilohertz) – KiloHertz are units express the number of times per second (multiplied by 1000) that a sampler 'slices' up a sound as it is grabbed into memory. Therefore, a sampled grabbed at 55.9 KHz has been sliced into 55,900 individual numbers for every second of sample. The general rule is that the higher the sample rate, the better the sound quality.

SEQUENCER – A sequencer is a program that enables you to 'arrange' sounds into a given order to produce music.

PHASER – When applied to a sample, a phaser produces a subtle whooshing sound reminiscent of the sound produced by an analog synthesiser by mixing a sound with itself. You've probably heard it a million times on pop songs – groups like Depeche Mode and Erasure use phasing effects extensively.

CHORUS – A chorus effect produces a fatter sound by blending a sound with two copies of itself – one played at a slightly higher pitch and another at a slightly lower pitch. This produces a nice harmony effect.

SHOPPING LIST

Stereo Master.................... £39.95
by MicroDeal
PO Box 68, St Austell,
Cornwall PL25 4YB
☎ 0726 68020

CHECKOUT STEREO MASTER

Features ●●●●○
Samples in both mono and stereo, comes complete with both an effects system and a powerful sequencer – what more could you ask from a sampler?

Sound Quality ●●●●○
Not quite on par with something like Audio Engineer, but then it doesn't cost £200! On the whole, the sound quality of Stereo Master is very good indeed.

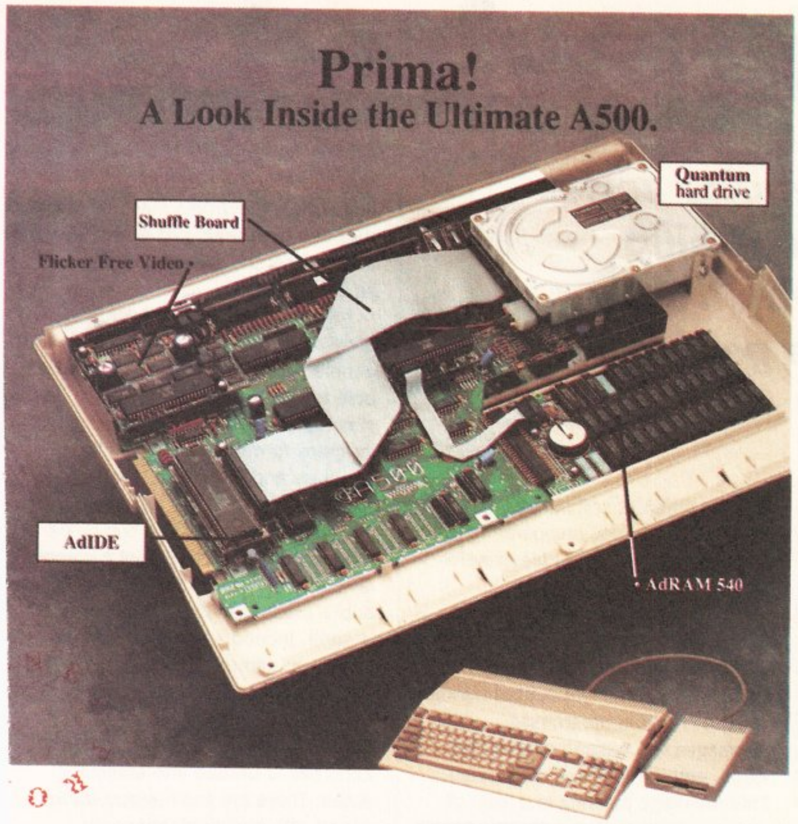
Ease of Use ●●●○○
The rather quirky editing system gets in the way a bit, but apart from that it's a nice straightforward package.

Price Value ●●●●○
It's still slightly more expensive than its main rival, but then what's £5 these days! – £40 for a sampler of this quality is still damned good value for money.

Overall rating ●●●●○

TechnoSound left MasterSound for dead, but Stereo Master is unlikely to be beaten that easily! Choosing between them has now become virtually impossible!

POWER COMPUTING



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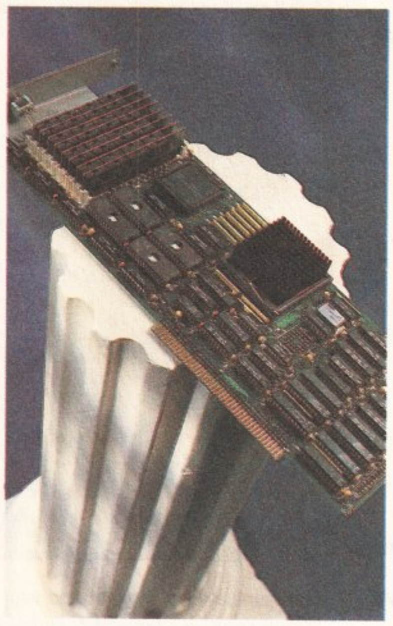


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Going on-line: why it's worth getting wired...

> "This new column aims to help you understand the language of comms. We start this week with a look at what the bulletin boards have to offer you."
> **Philip Harris**

In the first of a regular series on communication, Philip Harris looks at why it's worth your while getting hold of a modem

One of the most interesting areas of computing is in communications, linking up with other computers using a modem. Communications opens up a whole new world, even the most low cost modem gives you access to a plethora of computer systems, from the smallest hobby set up to be found on Fidonet to the enormous commercial, systems such as CIX or CIS.

We'll be taking a look at overseas boards, how they can save you money by ordering from abroad, and how much they cost to use. We start this issue with a quick look at Rodelokka BBS in Norway.

But in addition to modem based communications, there are a multitude of other ways to connect two computers together, from a simple serial link for playing games to full blown hardware based networking systems costing hundreds of pounds.

ALL THIS AND MORE

With all this power at your fingertips you'll need a guide, and so over the coming months *Amiga Shopper* will be covering all aspects of communications, from both the beginners' point of view and that of the more advanced user.

We'll be taking a look at both amateur and commercial systems and what they can offer the average user. We'll cover such mysterious topics as transfer protocols and data compression, pointing out ways of saving money as we go.

Of course there will be reviews of any useful comms related software that appears, and details of the best places to pick up all the free software which awaits you in the world of communications, and pointers to any areas which you may have missed.

As well as modem based communications we'll be taking a look at local communications, linking individual computers or a whole bunch together to share information and resources. We'll look at what advantages this has, and how much it could cost and how to go about it.

To get us started this issue we'll take a look at one of communications' biggest and well known computer networks, Fidonet, and what it can offer you.

FIDONET NETWORK

Fidonet is a worldwide network of bulletin boards, each run by enthusiasts in their spare time. The idea behind the network is a series of independent boards, running different software on different machines, co-operating to provide messaging and file transfer facilities.

Every night, each bulletin board telephones the next board in the chain and passes on any messages users have posted during the day. As time progresses, messages are passed all over the world, gathering replies as they go. This message passing is a form of electronic mail or e-mail, one of computer based communications' greatest strengths.

Which Board?

There are literally hundreds of bulletin boards around Britain, all catering for different interests. Knowing where to look can therefore be difficult.

Given below are a small selection of boards which are worth taking a look at. Boards will usually contain numbers for a few other boards and you'll soon end up with a list as long as your arm and you'll be able to find a board local to you.

01 FOR AMIGA One of the best Amiga boards.	☎ 071 377 1358
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END ZONE A big board, with plenty of Amiga files.	☎ 0524 752245
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ELECTRONIC MAIL

Using electronic mail, it is possible to have conversations with another modem owner elsewhere in the world, without the need for both of you to be available at the same time. You "post" a message into someone's electronic mailbox which they can then read next time they get the chance, they can then reply and so on.

Electronic mail is a quick and easy way to communicate with people you would not necessarily be able to talk to under other circumstances. We'll be covering its many forms and how it will affect us and our social life in a future issue.

Fidonet systems use two types of electronic mail, the most common is "echomail" which consists of public messages that can be read by anyone. Indeed anyone who thinks they have something to say can reply or comment on it's contents.

WHAT'S ECHOMAIL?

Echomail is divided into subject areas. There are the obvious areas, Amiga, PC, communications etc, but there are also more unusual subjects such as *Star Trek* or gardening.

Echomail messages are transferred all over the world and a message asking for help in an appropriate topic will very often return a whole host of replies from all over the world, making Fidonet an ideal helpline. Despite the large number of countries that the messages go through, English is the language which has been chosen for all Echomail so the majority of replies will be readable.

WHAT ABOUT NETMAIL?

Fidonet also provides "netmail". Netmail messages are private, only the person who wrote the message and the person who receives it are able to read its contents. Netmail is addressed to a specific board using its Fidonet address and only goes to the board addressed, although it will pass through other boards on the way.

Of course messages aren't the only aspect of Fidonet boards. Bulletin boards also carry file sections, usually divided into areas for types of computer and then into subjects. The number of files varies depending on the board. Some systems cover all major computers and have a couple of hundred files for major machines

while others specialise and can offer hundreds or thousands of files for the one machine. Amiga owners are lucky in that there are a lot of very good boards which cover all areas of Amiga computing, with so many boards available we'll be pointing you in the right direction.

Bulletin boards are a good place to obtain public domain and shareware software for the the price of a download. In a future issue we'll be looking at the best places to go, and what you can expect to find when you get there.

For a board to become part of Fidonet it has to be checked to ensure it does not contain any unsavoury areas or callers, then it will be assigned an identification number and be required to call another board every night, to pass on its messages.

A Fidonet address or node consists of three numbers, the first is the area of the world, Europe is 2. The second number is the region, for instance 252. The third number is the board's identification number, 120 for instance. Combined, these three numbers give a unique Fidonet address, 2:252/120.

Alternatively some areas operate a "midnight line" whereby a sysop (System Operator) can pay a flat rate every month and a central board will call each night and drop off and pick up messages. This prevents the owner of the board from ending up with a large phone bill, but is not necessarily always cost effective, depending on the speed of the board's modem and the amount of mail processed each night.

Not all bulletin boards are Fidonet of course, the cost of the nightly phone calls often prevents sysops on a tighter budget from joining the net. This makes little difference to the actual board although the lack of echomail means that the message base will often be smaller and less varied.

Boards will have their own local message areas though, often covering minority subjects such as horror films or *The Hitch Hikers Guide To The Galaxy*. Although the availability of software is a major part of bulletin board life, it is well worth taking a look at other sections of the board, you never quite know what you might find.

Over the coming months we'll be taking a look at some of the better boards. I'll be letting you know just what they have to offer in the terms of messages and files available.

Figure 1: What's the best way of saving money when down-loading files?

Compression	Archive Time	Unarchive Time	Archive Size
ARC	706.0 seconds	326.0 seconds	505116 bytes
PKAX	N/A	109.1 seconds	N/A
ZOO	237.6 seconds	105.5 seconds	499648 bytes
PKAZip	707.3 seconds	232.0 seconds	436898 bytes
LHArc	707.5 seconds	266.5 seconds	392605 bytes
LHA	326.5 seconds	65.1 seconds	391776 bytes

Times given are to archive/unarchive 41 files, a total of 686877 bytes

Figure 2: A Comparison of Compression Times

Term 18aLHZH unarchived in RAM:

LHarc	106.2 secs	
LHA	39.4 secs	

C:Directory Archive to RAM:

LHarc	359.5 secs	192389 (41.0%)
LHA	159.0 secs	187382 (42.1%)

ARCHIVING PROGRAMS

One thing that should always be on a modem user's mind is money, every second spent dialling a board is pennies in BT's pocket, and it's all too easy to forget how expensive your new hobby can be and end up with an enormous telephone bill. To help avoid this, we'll be looking at aspects of comms which have been designed to save your money, and also ways in which you can help yourself.

The first thing you will notice when looking at a file list on a BBS is that the majority of the files have funny extensions, .LZH or .ARC. These files are "archives".

Archives contain all the files relating to a particular program, bundled up and compressed into one, hopefully smaller, file. This file can then be downloaded and unpacked by the user, saving time and money.

There is a bewildering array of archive packages available nowadays, each one has its own advantages and disadvantages. Improvements made are usually in the amount of compression possible and the time the program takes to compress or decompress software.

● ARC (.ARC)
Arc was one of the first archive utilities and is beginning to show its age. New versions are no longer produced although you will find files compressed using Arc.

> ***"The faster the modem, the less time you spend putting a smile on BT's face."***

● PKAX (.ARC)
An unarchiving program only, PKAX allows very rapid unarchiving of ARC files.

● ZOO (.ZOO)
Another old timer which is again seldom used despite being quite fast.

● ZIP (.ZIP)
A popular archiver particularly on the PC, there are versions available on the Amiga though and ZIPs are becoming increasingly common.

● LHArc (.LZH)
The most popular archiver at the moment, not much faster than the older programs but, with a better compression ratio, it is almost standard. And most boards use it.

● LHA (.LZH/.LHA)
A very close relative to LHArc and completely compatible with the latter program but offering much faster compression and decompression and smaller archives. LHA is now taking over from LHArc although it makes very little difference to the user. See below for more details.

● ARJ (.ARJ)
A new PC based archiver which has yet to appear on the Amiga, although there is an UNARJ which will only unpack ARJ archives. ARJ is rapidly becoming very popular on the PC and is sure to appear on the Amiga soon.

The compression ratios and times vary between the programs, Figure 1 shows some example times for compressing a selection of 41 executable programs from an A590 to RAM: and then decompressing back on to the hard drive.

All of the archivers work in a similar manner. The majority must be run from the SHELL (a couple of Intuition based versions are detailed below) by typing their name, an option to tell the program to unarchive and the name of the archive. eg:

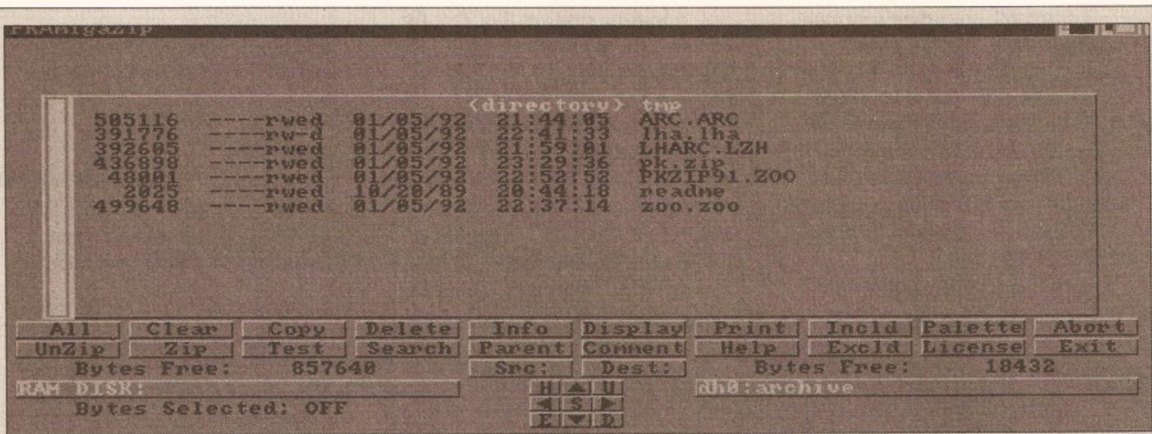
```
LHARC X TERM18A.LZH <RETURN>
```

Typing the name of the program on its own will usually result in help being displayed.

Nowadays programs will almost certainly be compressed using LHArc or LHA so a copy of the latter is a must for the new comms addict although you could do worse than get copies of the others as well, just in case. Each BBS you call will include a copy of the archiving program it uses, so if you haven't got it, you can soon download it.

LHA VERSION 1.0

Stephan Boberg has written a shareware archiver based on the excellent *LHArc. LHA 1.00* boasts much faster compression and decompression, and smaller archives than any other Amiga archive



PKAZIP has Intuition based gadgets and a mouse operated file selection. Here it's shown at work; it's slow but sure and very friendly



program currently available.

Figure 2 on page 35 compares *LHA 1.0* with *LHarc 1.21*, a commonly available version of *LHarc*. The first set of times is to unarchive the 442427 byte archive of *Term 1.8* (the new terminal program for Workbench 2). The second set of figures give the size and compression time for the contents of a C: directory of an A590 into RAM:. The directory contained 71 files, a total of 320266 bytes.

As you can see, there is a slight reduction in size of the archive produced using *LHA* but the biggest improvement is in the time taken for both archiving and unarchiving. What is even more amazing is the fact that the registered version of the software is even quicker.

The software also includes a self-extracting archive utility which will create executable programs which unpack themselves without the need for the *LHA* program itself, and indeed, this is how the archiver is distributed. Well worth the $17 registration fee.

INTUITION BASED ARCHIVING

Many users will and do shy away from using Shell-based programs. To this end versions of *LHArc*, *LHA* and *PKZip* have been produced which use an Intuition based interface which makes things a little more friendly.

● LHARCA

LHArcA is the intuition version of *LHarc*, and is a well presented, reliable program.

Individual files can be selected using the mouse and the source and destination of files set with ease. All the usual archive facilities are there, including testing, deleting and password protection.

LHArcA manages to run as fast as *LHArc* so there is no disadvantage for using the user friendly front end and first time users will find the system much easier to come to grips with, particularly if only a single file is required from the archive.

● PKAZIP

The second Intuition archiver is the *PKZip* version of *LHArcA*, *PKAZip*. It takes a similar approach to *LHArcA*, with Intuition gadgets and mouse operated file selection. It's not the fastest beast around but, for beginners, it's certainly very easy to use.

● LHA

Stephan Boberg has a whole host of *LHA* goodies up his sleeve for the future, not least an Intuition based version of *LHA*. At the moment *LHA* looks set to become *the* archive utility and with the addition of an Intuition interface things can only get better.

NCOMM UPDATE

There are two extremely popular comms packages on the Amiga, *JRComm* and *NComm*.

JRComm is a shareware program from America while *NComm* is a Norwegian comms package, designed to allow software to display Norwegian characters. Rodelokka BBS is the support board for *NComm* and similar programs on other machines.

Without a doubt, Rodelokka is a big board. There are over 7000 files covering everything you could think of. The software is split between Amiga, ST and PC with sections for Unix, C, general programming, Amiga, Graphics, TeX, Fish Disks, UUCP and much more, a file hunter's paradise.

Messages are less useful on Rodelokka, being a Norwegian board all the messages are in Norwegian, so, unless you're a bit of a linguist, they make difficult reading. However you can often get the gist of what is being said, and some of it is very interesting.

Of course Rodelokka is also the place to catch up on what is happening with *NComm* and get the latest updates. The current release, 1.921 contains several enhancements and important bug fixes and should be available as an update to version 1.92 from a bulletin board near you.

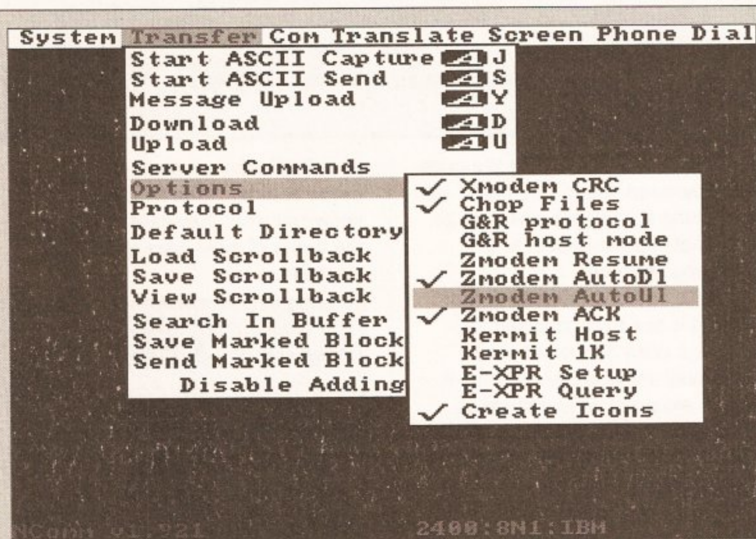
Development of the program continues though, and in a recent conversation with Arvid Johansen on the Rodelokka BBS, he mentioned some of the potential improvements which are on the way in version 2.

The biggest improvements are in the script handling, in particular, the addition of an ARexx interface which will enable other programs, including ones you have written, to communicate directly with *NComm*. The *NComm* script language itself is also due for improvement, with the addition of numeric variables and arithmetic operators and improved string handling facilities, similar to BASIC.

Other areas to be improved include, the phonebook, with new gadgets and encrypted password, improvements to the scrollback facility, improved macro key support, better terminal emulation, including flashing text and the addition of 1200/75 baud support, seldom found in Amiga comms packages, which will be welcomed by users on a lower budget.

Currently there is no indication as to when the software will be available and it is likely to be some time before we see the new version, but you can be sure that we'll keep you posted.

Rodelokka BBS can be called on ☎ 010 47 2380949. I must add that calls to Norway are not cheap and you would be advised to keep it brief, particularly if you're the one who pays the bills.



***NComm*, one of the most popular packages available. It's completely free and there's a new version on the way very soon...**

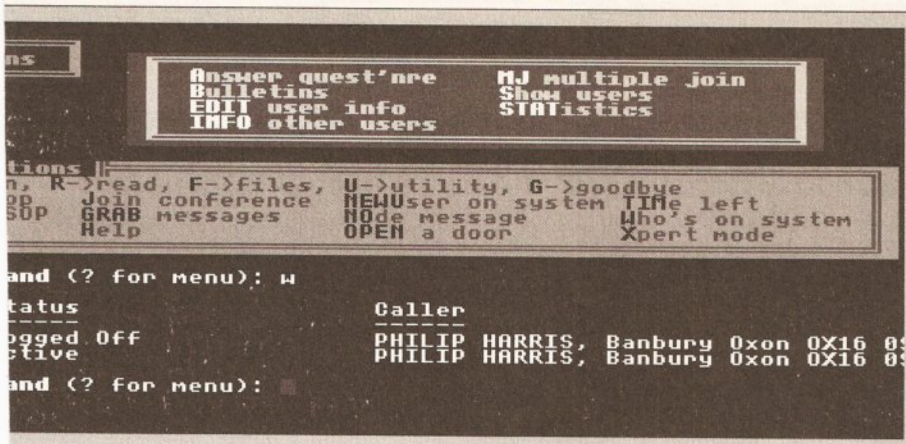
NCOMM UTILITIES

While wandering the boards *NComm* users might like to keep an eye out for a couple of useful little programs written by the program's authors: *CallInfo 1.3* and *AddCall 1.3*.

CALLINFO V1.3

The first program reads in an *NComm* log file which contains details of which boards you called and when, analyses it and produces a report, including graphs of weekly and daily usage, details of the boards most commonly called and most importantly, an estimate of the cost of all your excursions so to date.

The estimate is calculated from a data file which contains the cost to call a board with a particular dialling code during peak and off peak times although there are only two possible charging bands which limits the programs usefulness slightly.



Rodelokka BBS, home of *NComm* and several hundred Norwegian people. On Rodelokka, there are more than 7000 files which cover almost any subject you can think of. However, it would come in handy if you spoke Norwegian to get the full benefits of this board

ADDCALL V1.3

The second program also operates on your *NComm* log.

AddCall opens a window on your Workbench screen, the window contains gadgets for a name and telephone number and a gadget which you click on when starting a telephone call and again when you finish it. The call is then added to your *NComm* log and you can take voice calls into account when using *CallInfo*. Even if you don't use *NComm* these programs come in useful to keep a watchful eye on your phone bill.

A BRAND NEW TERMINAL HITS THE TOWN

A new German terminal program is now doing the rounds, with the aim of knocking *NComm* off its pedestal – *Term 1.8*.

Term 1.8 was written by Olaf Barthel and makes extensive use of the new Workbench 2 operating system. Although this makes for an up-to-date and exciting program, the many owners who have yet to upgrade to WB2 will be disappointed, particularly if they just spent half an hour downloading the archive.

The list of features is extensive and includes, an ARexx interface, save and print screen functions, a built-in text editor, support for XPR external transfer protocols and touch tone dialling via your Amiga's speaker, although the usefulness of this is debatable.

We'll be taking a look at *Term* in a future issue and comparing it with the current favourites, *NComm* and *JRComm*. The massive Term archive (442427 bytes) is available from Guru 10 BBS on ☎ 0738 52063 as TERM18A.LZH.

THE GURU STRIKES

Finally, a quick look at a board which has just reopened, Guru-10. The board has been around for some time but the system's hard drive was tragically taken ill in July. The problem was eventually fixed though, but the sysop of the board moved house and the board closed.

Guru-10 has now reopened on a new number and although, at the time of writing, things are a bit quiet, it's sure to hot up. The files section of the board is very good. A nice selection of utilities, virus killer, demos and graphics will keep you occupied for quite a while.

The board is currently awaiting to receive its Fidonet node (it did have one before so it shouldn't take long) so there are several message areas which do not work. Not for long though and there are plenty of local message areas to keep you amused.

The board also features a selection of games, including *Friday the 13th* which finds you trying to stalk Jason across a holiday camp, the space conquest game, *Space Empire*, and *Global War*. All good clean fun. Add a friendly sysop plus enthusiasm and you end up with an excellent board – well worth a visit.

GURU 10 can be found on ☎ 0738 52063 twenty-four hours a day. However the board closes between 1200 and 0100 for the transfer of network mail. The sysop is Simon Cansick and the board runs at 300 – 14400 baud.

THAT'S ALL FOR NOW

That's it for this now. Next month we'll be going into the social side of comms with a look at CIX and conferencing. AS

Philip Harris can be contacted on CIX as piharris or on Guru-10 BBS.

IN A MUDDLE ABOUT MODEMS?

The first thing a computer user needs to enter the world of comms is a modem, but which one? There are many types of modem, all with varying capabilities and costs. At first sight things can be very confusing.

The most important factor for any modem user is going to be speed. Obviously the faster the modem, the less time you will spend putting a smile on BT's face. The various speeds of modems are usually classed using "V" codes.

● V21 300/300

Sends and receives at 300 baud (bits per second).

V21 modems can be picked up for next to nothing these days. Unfortunately the lack of speed makes it a false economy; you'll end up spending more on phone bills than you saved on the modem.

● V22 1200/1200

Sends and receives at 1200 baud.

Slightly faster and hardly any difference price-wise, V22 modems are still too slow for most people, although they make an ideal introduction to the world of comms until you scrape together the pennies for a faster setup. This is something you will probably soon want to do.

● V23 1200/75

Sends at 75 baud and receives data at 1200.

Commonly found in combination with a V21 option, this split speed can be used to access most boards and can again be picked up for next to nothing.

● V22bis 2400/2400

Sends and receives at 2400 baud.

The slowest sensible speed for even moderately serious comms work. Downloading files at anything slower will cost a fortune. V22bis modems have recently dropped in price and can now be picked up for less than £100.

Once you get serious about your comms you will want to upgrade to an even faster modem, and this is where things begin to get complicated.

V32 is one standard for 9600/9600 baud modems, introduced in 1984 with the newer V32bis standard pushing the speed up to 14400 baud.

A second standard has also established itself, HST. HST modems are again 14400 baud and have become the standard high speed modem for most boards, finally there is the HST Dual Standard modem which is both HST and V32 compatible although the increased cost is seldom justifiable.

DATA COMPRESSION

Another area of communications which is becoming increasingly important is that of data compression, often built into the modem itself.

MNP (Microcom Networking Protocol) data compression and error correction are available to several levels. Levels 1-4 are error correction protocols which enable the modems to verify that data is transmitted correctly, instead of the transfer protocols doing it themselves. Level 5 adds data compression but trying to compress an archived file will generally increase its size, making MNP level 5 less useful than it would seem.

Some terminal programs offer built-in MNP error correction, up to level 5, but such Amiga software is rare Amiga and no-one has come up with an MNP 5 comms package for the Amiga. Although they do exist for the PC.

The CCITT V42 standard provides error correction using MNP 2-4 and a second type, LAP-M, the newer V42bis standard adds MNP5 LAP-M data compression which leads to a four times faster throughput. Of course this only applies to normal data, downloading of files will not be improved so don't be fooled by 2400 baud modems which claim to run at 9600 baud using V42bis.

AT WHAT PRICE?

Prices for the different types of modem vary considerably, 2400 baud modems can be picked up for less than £100, particularly second hand, while the faster HST modems cost £400 upwards. Obviously it would be unwise to dive in at the deep end so a cheaper 1200 or 2400 baud modem would be a good starting point, depending on your budget.

But once you get bitten by the bug a faster modem will become essential and it's worth keeping an eye out for second hand bargains. Most boards include a sales section and that's an ideal place to start looking.

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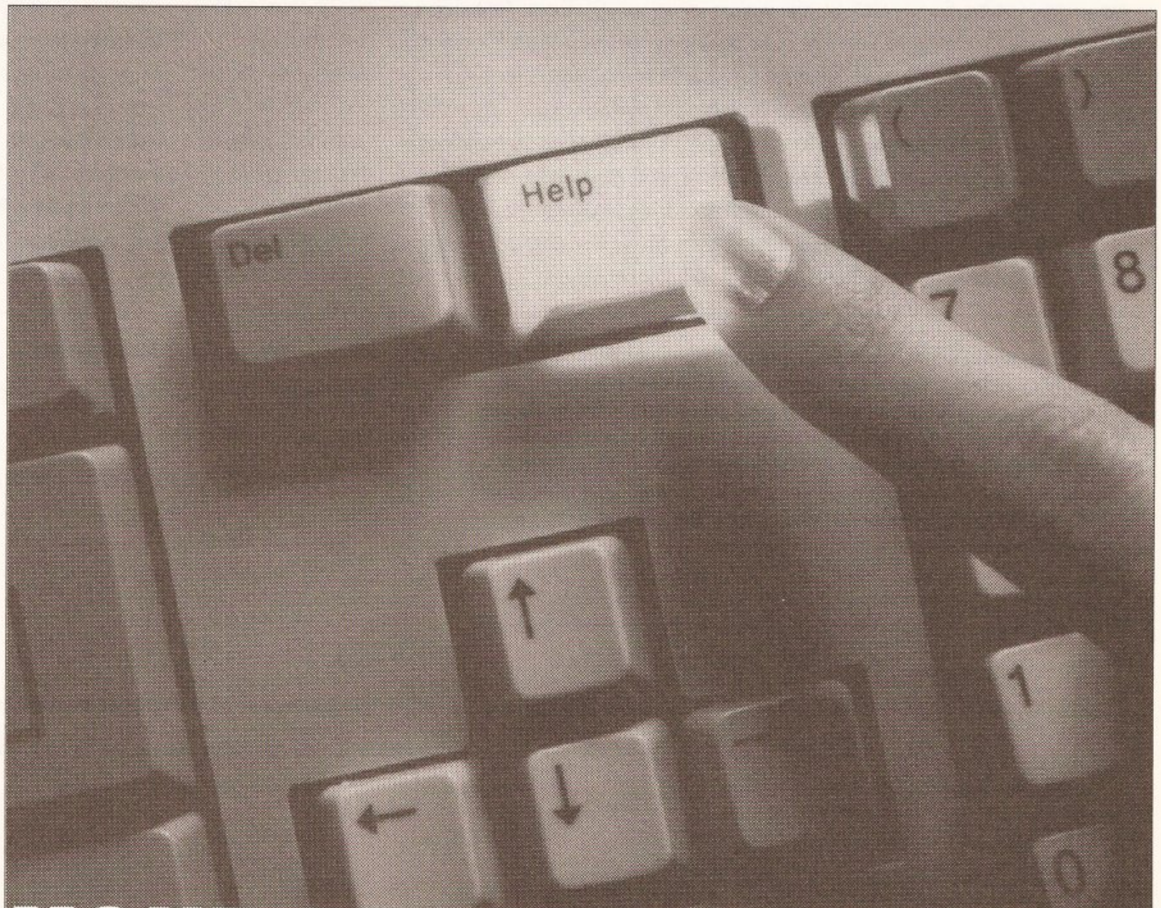
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Beginners: this icon will appear next to any questions which are 'basic' in content.


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Caution: be sure that you fully understand the answer before trying it out.


Danger: the answer to this question could well invalidate your warranty – or you!


Hardware: this icon is used to denote questions relating to general hardware.


Buying advice: we use this icon if the question asks us for buying advice.


Printers: this icon denotes a query about printers, printer drivers and so on.


Technical: any queries about programming will have this icon next to them.


Video: this icon relates to any query about using your Amiga with video hardware.


Music: this icon is for questions about MIDI, sampling, synthesizers and so on.


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We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of all three of *Amiga Shopper*'s consultant editors – Jeff Walker, Mark Smiddy and Phil South – and, of course, our resident technical editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping whatever the subject of your query.

Each panelist will be dealing with queries in their own specialist area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem. Below is a list of their areas of expertise. It's a list that we will add to and update every month, so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	Video
Paul Overaa –	Programming, music
Mick Draycott –	Hardware, programming, MIDI
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Mark Smiddy –	AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives
Jason Holborn	Public Domain
Phil South –	Graphics, AMOS
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If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________

Address: ______________________

____

____

Your machine:

A500 ❑ **A1000** ❑ **A1500** ❑

A2000 ❑ **A3000** ❑

Approximate age of machine: ________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ❑ **1.3** ❑ **2.x** ❑

Workbench revision (written on the Workbench disk)

1.2 ❑ **1.3** ❑ **1.3.2** ❑ **2.x** ❑

PCB revision (if known). Do not take you machine apart just to look for this! ________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ________

Chip memory available (see AVAIL in Shell) ________

Agnus chip (if known) ________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer ________

Extra drive #2 (3.5"/5.25") as DF__: Manufacturer ________

Hard disk: ____Mb as DH__: Manufacturer ________

Extra RAM fitted – type, size in Mb and manufacturer ________

Details of any other hardware which could help us to answer your question:

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

AS 11

BRIDGE THE GAP

I purchased an XT Bridgeboard and Hard disk second hand from an advert in *New Computer Express*. The hard drive works fine but is it possible to speed it up (it is as slow as a floppy) and make it autoboot so I don't need Workbench floppies?

D Earl
Bedford

The Janus hard drives are not fast, because the XT Bridgeboard reads the data from the hard disk, and squirts it through a block of memory that is shared between the Bridgeboard and the Amiga. An Amiga program then detects this data and converts it back to Amiga files. It's just as slow the other way around if the Bridgeboard is trying to read files from a partition on an Amiga drive and controller.

It is faster if you have an accelerator in your Amiga, or if you are using a faster Bridgeboard, but not much faster. Your best bet is to keep the Bridgeboard hard drive purely for the Bridgeboard, and get a new SCSI hard drive and controller for your Amiga side.

As for autobooting, unfortunately the Amiga Janus software has to be running for the PC to boot. You can create a very simple bootdisk that will transfer control to the PC drive when it has loaded, and if you have enough memory you can create a small recoverable RAM disk and copy these files into that so you will only have to boot from floppy once after turning the power on. ***JR***

WHAT A DIN

I use my A500 with the family TV (Hitachi CPT2176), using a split feed aerial/computer output switch into the TV aerial socket. The TV has no SCART connector, but it does have a DIN socket which is described as "AV IN/OUT for VCR/Video Disk Players". Would I get a clearer picture if I connected the A500 directly to the DIN socket and, if so, where could I get a lead for the purpose?

WT Arbon
Polegate
East Sussex

Good thinking there, Mr Arbon! Assuming that the DIN socket accepts either composite or RGB video signals then I see no reason why you can't use it to improve your computer viewing.

You should be able to obtain a lead ready made from a supplier such as Trilogic ☎ 0274 691115 or Videk ☎ 081 2046690. I think you'll appreciate the difference in picture quality. ***GW***

PRINT WITH PANACHE

When using *PageSetter II* with my DeskJet 500, it won't print the last bottom inch or so. I've tried different paper lengths, margins, virtually everything. It also seems to offset the page slightly to the left and down.

If you ever hear of a Deskjet 500 printer driver for the Amiga please print where we can get it.

Gavin Chinien
Warley
West Midlands

The HP_DeskJet printer driver that comes with the Amiga will only print graphics within an 8in by 10in area, which is why your bottom inch or so is going missing.

Luckily for you there is indeed a proper DeskJet 500 driver available, and you can get it for a couple of quid from *Just Amiga Monthly*, 75 Greatfields Drive, Uxbridge UB8 3QN. Ask for Jamdisk #8. ***JW***

CHEERLESS CHIP RAM

My Computer (Amiga 1500) has no fast memory which seems to affect some programs which use this, particularly public domain demos (*Zero Defects*, *TAS Ego Trip* and so on). Is there a cheap and simple add-on solution, or am I doing something wrong when loading?

J Gurney
Gillingham
Kent

The problem is due to sloppy programming. With 1Mb of Chip RAM system, memory areas are not in the same place as in machines with Fast RAM, so some programs (particularly demos) object strongly. Adding some Fast memory into your system will allow these system areas to move so more (although by no means all) of these programs will work. ***JR***

OL' STARTUP BLUES

I have an Amiga 1500 with a 20Mb hard drive installed as DH0:. The hard drive was purchased second hand and I therefore have no instructions: this is where the problem starts.

The drive was formatted and ran perfectly until I added a line to one of the Startup-sequences on DH0. Now, every time I boot I get an error message "Invalid argument to echo" and "unknown command [1mSpirit". Spirit was resident on the hard disk as a file. Using the CLI, I have determined that all the HD files are still there, but I cannot access anything apart from the autoboot files.

I did back up the disk with a PD hard disk backup program, *MRBackup*, but when I try to restore my work, I get a message "Can't lock dh0:" and I can't read the backup disk because it says not a DOS disk in df0:. I know the hard disk is OK because although its icon does not appear, the pointer on boot is the pointer used in the HD boot. The only computer shop nearby is no help, because it only wants to sell things.

CO Stride
Culcabock
Inverness

OK, let's take this one from the top. You are assuming the HD is OK because the correct pointer (sprite) appears. In fact, this is taken from the bootup floppy and has no bearing whatsoever on the hard disk.

What has happened is this: in editing your Startup-sequence you have inadvertently split a line in two. The original probably read something like this:

```
Echo "Starting *e[1mSpirit"
```

The idea being to print the message in bold – that's what the *e[1m bit means, try it. I suspect that part of the file now reads something like:

```
Echo "Starting *e
[1mSpirit"
```

The first line will generate an error, but it won't stop the Startup-sequence script. The second line will – because AmigaDOS is looking for a command file called '1mSpirit"' – note the extra quote at the end. Since it can't be found the script grinds to a halt.

Now to the solution. Boot your hard disk until it stops, then enter:

```
DH0:c/ED DH0:S/Startup-↵
sequence
```

Letter case is not important, but you must enter exactly that. ED should now open the offending script. Position the cursor just after the "*e" part I've shown above, press the escape key (it's marked ESC) then press "J" then [Enter]. Notice how the two lines are joined. Now go through the same sequence again, using "X" instead of "J". That's the command to make ED save and exit. Wait a few seconds, reboot your machine and everything should be back to normal.

The problem with *MRBackup* is an odd one – but I'm not all that surprised. Being PD, it's hardly the most stable of backup programs around and my one and only attempt resulted in dismal failure. I suspect, given the way your boot disk is constructed, the hard disk must be fully booted before *MRBackup* will be able to work. There isn't room to explain why here I'm afraid. ***MS***

THIRD TIME UNLUCKY

I am starting to get worried about my A500. I have had it just over two and a half years and have got through no less than three power supplies. The first two didn't work at all and now the third has packed in. Could you please tell me if this is something to do with my computer, and if so, what I should do about it?

Mark Barlow
Killamarsh
Sheffield

The history of A500 PSUs is surrounded with mystery and a fair amount of smoke; and it's fair to say they are the weakest link in the Amiga's system. A retailer I spoke to recently pointed to a pile of returned machines and commented angrily, "What do you reckon's wrong with that lot? Power supplies – again!"

As you can see, this problem is all too widespread – but three is verging on the absurd. Recent

continued on page 46

JARGON BUSTING • JARGON BUSTING

Chip RAM – This is the area of the Amiga's memory directly accessible by the custom graphics and sound chips.

Echo – An AmigaDOS command which outputs text to the screen, in much the same way as Basic's Print command.

Fast RAM – Any extra memory which is not Chip RAM. The custom chips cannot access it, and because such accesses to chip ram can block out the central processor and slow down its own accesses, Fast RAM is faster.

Printer driver – A program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

SCSI – Small computer systems interface is the standard used for connecting hard drives, CD ROM drives and tape back-up units to computers.

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continued from page 43

machines have been supplied with better designed PSUs but that doesn't help you. Since the machine is no longer covered by warranty, I'd suggest you invest in a high-power PSU from WTS electronics. Although it costs about 50 quid, it's worth the investment. WTS is on ☎ 0582 491949. It's probably worth mentioning, too, that power supplies are very susceptible to heat and must be given adequate ventilation. Don't place your PSU near to a radiator or bury it under a pile of magazines. I mention this as a warning to all readers – in the hope at least some of the problems can be eased. ***MS***

FOILING THE FLICKER



I have an Amiga 500 with 1Mb Chip RAM (2Mb Fast RAM in A590) and an external drive. My problem is with the dreaded flicker you get in hi-res modes. I have tried rapidly opening and closing my eyes to get in sync with the monitor, but to no avail! Before I end up with nervous twitching eyelids, could you please give me some idea:
a) What is the difference between the Microway flicker fixer and the ICD flicker fixer, apart from £110 in price?
b) Would they both work on an A500, or do I need to upgrade to a 1500/2000?
c) If I stay with the A500, will I need to upgrade the power supply?
d) If I do fit a flicker-fixer to the A500, would I ever be able to fit an accelerator (even just the AdSpeed), or do they occupy the same space?

Nigel Bates
Nuneaton

OK, I'll tell you a little about the three available de-interlacer devices (to give them their proper name), and then I'll tell you why I think you don't need one.

The Microway Flicker Fixer was the original device: it only works on the Amiga 1500/2000 and does not scan double on low-res modes (which means that it tries to de-interlace them, which means that any fast movement, such as game graphics, get terribly messed up on the display). You also loose about 8 lines from the bottom of the display.

The Commodore A2320 card is by far the best available at the moment. As well as a switch to disable the deinterlacer when you don't want it, it double scans the low-res mode, removing all the black scanlines without affecting animation. Again, it only works in the 1500/2000.

The ICD Flicker Free Video board is the only board that works in the A500, but it also tries to scan-double the low-res modes and is not switchable, so you will have to switch the monitor between the new and the old monitor outputs quite regularly.

Fitting the ICD board inside the A500 will probably not leave you any room for any accelerator except the ICD AdSpeed, which is so slow it's definitely not worth bothering with, which is why I suggest you don't get a de-interlacer at all.

Instead, buy the new Kickstart 2.0 Enhancer pack when it becomes available. This contains the new Kickstart 2.0 ROM, which you will want anyway as it is a vast improvement over Kickstart 1.3, and the new Denise chip. With the new Denise chip you can run Productivity mode, which is flicker-free with a multisync monitor. Applications such as word processors and desktop publishing will benefit from this particularly, although it will not de-interlace the standard screen modes.

As it is only a single chip replacement it is both cheaper and easier to install than the ICD board, and will work on any Amiga. It will also give you the room to install a decent accelerator board, such as the Microbotics VXL-30. ***JR***

SOUNDS MONO



Audio voices 1 and 4 do not appear to work. I first noticed this using MED and naturally assumed it was a fault with the program. I noticed the same thing using the sound commands in *ABasic*, *GFA BASIC* plus other music and sound packages.

The music in games seems OK, but I can't be sure. I suspect my machine has suffered this fault since the day I bought it. Do I need a new Paula chip or is it something else? If I do need another Paula, where do I get one from and how do I fit it?

K Jones
Tenbury Wells

Not a common fault I'll admit – and I doubt your Paula chip is at fault. Although you are correct in noting that Paula controls the sound, it also manages the disk drives, so if it had gone down it seems unlikely the fault would be limited to just that. Are you sure the machine is at fault? Channels 1 and 4 (more correctly 0 and 3) are coupled to the left audio port. Therefore, have you checked the audio routing cable between the monitor and the machine? If you are using a modulator, have you checked the Y adaptor?

The easiest way to test these is to exchange the left and right channels. If the sound swaps from right to left, then the fault lies with the cabling; if not, get the machine tested by an authorised repair centre who will have the necessary equipment. It may just be a simple "dry" joint on the PCB – at the phono connector for instance.

If you decide to follow the repair route (and I'd respectfully suggest you leave it to an expert) WTS Electronics in Luton (☎ 0582 491949) can supply the part. Fitting it is very simple, first take a large hammer… ***MS***

VIEWDATA QUERY



I am looking for a terminal emulation program (preferably PD or shareware) that will handle 1200/75 Videotex (Viewdata) type data like that on Prestel in Britain, Teletel/Minitel in France and elsewhere in Europe and commercial dial-up services similar to that provided by AT&T/Istel for the travel trade in Britain.

Harold Wicks
HemelHempstead

As far as I'm aware, there's nothing available in the PD libraries to do the job. Standard VT100-like terminal programs are available(*NComm* is about the best though), but there's nothing in the way of Viewdata software. A couple of libraries did distribute a Viewdata package called *SuperText* about a year ago but this was withdrawn when they realised that it was a commercial product.

The only commercial Viewdata program available to fully support the split baud rates needed to access systems such as Prestel is *RubyComm* which is available from Y2 Computing on ☎ 0923 50161. Kuma's *K-Comm II* does support Viewdata but not split baud rates, so it's a little limited. ***JH***

GRAPHICS PLUS



I am thinking of buying an Amiga 500 Plus for use with my video equipment (for graphics, titles etc). My question is whether the A500P can be fed to a Panasonic AVE5 digital mixer without needing any extra genlock? AVE5 mixers do not accept RF signals.

Also, for use as a video graphic mix would it be worth buying *Deluxe Paint IV*?

RA Hallett
Tintern
Gwent

As far as I can tell all you will need is a way of getting a composite video signal from your Amiga, then feeding it into one of the channels of your AVE5 mixer. By choosing your colours carefully you could then superimpose (key) or mix your Amiga graphics with the video signal being fed into the other channel. So you are going to have to purchase at least an RGB to video converter – though I'm really not sure if these are easily available any more. Triangle TV (☎ 081-8743418) used to make them, though I don't know of anyone else. So if any readers have any info on this I'd be happy to be informed.

The other alternative is to buy a genlock. I guess you were probably hoping that I wouldn't say that – but hang on a minute. Not only will you have a method of getting composite video output from your Amiga, but you could also create more complex effects than if you were to simply mix the Amiga graphics with another video signal. How about feeding one video source through the genlock, adding captions, then sending the mix to the AVE5 and adding another video feed there? Think of the possibilities! You'll probably even find this system to be more flexible in the long run. There are a number of good genlocks on the market, with a wide variation in price and features. I would have thought a model like the Rendale 8802 would be sufficient for your needs.

By all means buy *Deluxe Paint IV* – it's excellent and will certainly fulfil many of your graphics requirements. You will probably also want to consider buying a dedicated titling package – again there are quite a number to choose from, though *Scala 500* looks as though it will best cover your needs. But be warned – to get the best out of your Amiga you'll have to think seriously about adding more memory (at least 2Mb is now almost obligatory for graphics and animation), a second disk drive and if you can afford it (along with everything else) it's worth thinking about a hard disk too. ***GW***

TELLING TALES



I have an Amiga 500, a printer and an external disk drive. I am very forgetful when it comes to spelling. I spell a word correctly at the beginning of the page, then spell it wrongly at the bottom. I am a very bad speller. I am trying to write poetically, and at the same time trying to write stories, which brings me to my question.

Which would be the best word processor for me? I don't have a lot of money and I am totally new to computing.

WA Hodgson
Consett
Co Durham

Without a doubt your should go for Gold Disk's *TransWrite 2.0* word processor, which costs about £40

(or less) and comes with a fairly comprehensive spelling checker. ***JW***

OVER THE RAINBOW



If my Amiga is switched off for 24 hours or more, when it's switched back on the monitor first displays an orange screen then goes through shades of grey showing all is OK. Between two and 24 hours, a shade of pink appears, before the greys. Under two hours or after a soft boot, everything works as normal. The machine seems to be working normally, but I wonder if a problem is starting to appear?

I understand these colours are not recognised as error messages by Commodore. I have not managed to get the same answer twice from anyone at Commodore or my dealers. Can you help please?

RP Taylor
Oakwood
Derby

The colours you describe are not error messages. Although I'd guess you may have heard of the boot error messages when the screen goes red, green, yellow or blue. These faults show a problem with the ROM, CPU or custom hardware, and appear during the grey-ramp test. It's most likely your monitor is playing tricks on you – especially if you have it connected directly through the SCART socket. Relax, since the machine seems to be behaving itself, just ignore those colours. If a fault develops you'll be the first to know. ***MS***

HARD ANSWERS



I would like to fit my Amiga 500 with a SCSI hard drive which offers at least 50Mb of storage and will allow me to add 8Mb of RAM to my machine by fitting RAM chips inside the drive. There are so many available on the market that I'm not quite sure which is the one to buy. Which would you recommend?

At a later date I want to add a CSA Mega Midget Racer processor accelerator to my machine. Is this a good choice or have you a better suggestion? I've also heard that the CSA unit has problems working with some hard drives, so the drive I choose will have to work properly with the CSA processor accelerator or whichever card you recommend.

Antonio Masse
Portugal

You're very wise in checking the compatibility of hard drives against the processor accelerator you're intending to purchase. Too many users splash out on expensive hardware only to find that it is incompatible. This is especially true if you're going to splash out on the CSA Card – when we tested it in issue three of *Amiga Shopper*, we found that it didn't like a number of drive controllers including the Commodore 2090 controller and the ICD AdSCSI.

There are quite a few 'cheap' processor accelerators available but the CSA Mega Midget Racer is about the best there is. Another card worth considering is the B5000 from Solid State Leisure. It's a 25MHz unit as opposed to the CSA's 33MHz, but Solid State has recently slashed the prices on its cards so you may well be able to pick up a B5000 very cheaply.

If you're after a hard drive for the A500, then there is quite simply only one choice – the GVP Impact Series II. This absolutely superb unit is available in either 52 or 100Mb capacities and offers an 8Mb RAM expansion capability onboard. What's more, it's very cheap and very, very fast (it's about the fastest A500 drive available!). Call Silica Systems on ☎ 081 309 1111 for more.

GVP did encounter a few incompatibility problems between its drives an third party processor accelerators but I think these have now been ironed out. If in doubt, check with Silica before you buy. ***JH***

GHOSTS IN THE MACHINE



I am using a Sony 1420 portable TV as a monitor. I bought a SCART lead but all I got was a ghost image. I was told that I need a special lead for the Sony, but I can't get hold of one. Can you help?

D Thorogood
Dagenham
Essex

This ought to be no problem. Call Trilogic ☎ 0274 691115 or Videk ☎ 081 2046690, either of whom should be able to assist. ***GW***

ASSEMBLER OBJECTION



I was wondering if you could help me. I program in machine language using a Kuma *K-Seka* assembler which works well, but, when I save the assembled machine code and try to run it from Amigados using RUN, it just returns with the error: "Unable to load CODE: file is not an object module". Could you please tell me how to cure this problem?

R Tweedie
Walsall

K-Seka is hardly the easiest assembler in the world to use. I strongly suggest you invest in the new *Devpac 3.0* package from Hisoft: it is a far superior assembler. Your problem is that you are not writing out an Amiga object file. To do this you have to use the WO option in *K-Seka*. If you are interested in the actual file format of the object files, read the AmigaDOS manual (3rd Edition) by Bantam. ***JR***

JARGON BUSTING • JARGON BUSTING

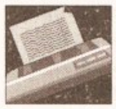
Accelerator – A more advanced central processor, operating at a higher speed. Useful for calculation-intensive applications, such as 3-D rendering.

Baud rate – Basically, the number of bits (or binary digits) that are sent down a transmission line per second.

Genlock – A way of slaving one video source (eg Amiga) to another (eg video tape) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

Object file – A runnable program – one which works without the aid of an intepreter.

ESCAPE TO MICROLINE



I have an old Microline 84 printer which works rather well with the Generic printer driver. However I wish to have a "Skip over perforation".

In the Workbench manual the printer escape codes give the perforation skip code as ESC[nq. Where does the escape code go? In the manual it says that I can use BASIC or C Language. How can this be if I use the CLI or Workbench to use the printer? Help please!

Raymond Taylor
Dundee

Firstly, check your printer manual to see if there is a DIP switch you can set to cause the printer to skip over the perforations of fanfold paper. If there isn't one, the odds are that the Microline 84 doesn't have this feature.

Escape codes are normally sent to the printer via the software you are using – the word processor, spreadsheet or whatever. It'll almost certainly be a little different for every piece of software you use, so check your software manuals to find out how it's done. ***JW***

TO BOOT, OR NOT



After successfully using my A590 hard drive for several months I recently had to reformat and re-install it. Despite several attempts, the A590 now stubbornly refuses to self-boot and can only be accessed when the Workbench disk is loaded into the internal drive.

The people at Evesham Micros suggested that the startup-sequence may be corrupted on the A590. I re-installed this from Workbench but there was no change. I also followed all the prompts in the A590 setup disk. Can you help?

GB Genner
Stourbridge
West Midlands

We certainly can. Under the hard disk partitioning and formatting options there is a gadget to determine if a partition is just mounted or bootable. Start the program called HDToolbox and select the gadget marked "Partition Drive" (you have to do this even if you only want a single partition). You now have two options:

- If you want the default setup of two equal partitions, just click on the gadget marked "Default Setup".
- If you want a specific setup, click on the button marked "Advanced Options". This allows access to no less than eight more gadgets. Now click on the word "No" in the box next to "Bootable?".

Now click on the OK gadget to return to the main screen. Finally, click on the "Save Changes to Drive" gadget and exit. Your A590 should now boot as normal – it isn't usually necessary to reformat and re-copy Workbench after this operation since it only sets a flag in a private area of the disk. ***MS***

HARLEQUIN QUERIES



I am contemplating buying a Harlequin 24-bit colour card and a multi-sync monitor. But first there are some questions I would like to ask.

My first question is how many different colours can be displayed on the screen at the same time? I know that the Harlequin has a palette of over 16 million colours, but can every pixel at any screen resolution be set to a different colour?

I've also heard that the Harlequin board gives some extra higher resolution screen modes. Is this true? Could I still use the normal Amiga screen modes?

Is the Harlequin compatible with the new WB2 and ECS screen modes?

Finally, with regard to the multi-sync monitor, is it possible to

convert a multi-sync into a TV, like you can with a 1084 monitor and a suitable adaptor.

F Chan

I think there are some wires crossed here somewhere about the Harlequin (and other 24-bit devices, for that matter). With regard to most of your questions it may help to remember that the Harlequin is a display device which requires a second monitor on which to show any 24-bit images which are passed to it. This means that the Amiga and its monitor will function normally (including ECS and WB2 functions) whilst the Harlequin board outputs to the other monitor, using any of the Harlequin's resolutions.

Each pixel at any resolution can theoretically be a different colour, so it is possible that all 16 million colours (actually 16,777,216 colours) could be on screen at once if you can obtain a screen resolution of at least 4000 by 4000 pixels. However, this is still a bit much for a lowly Amiga to handle. So you can only have as many different colours as you have pixels on the screen, though this also depends on the number of colours in the current palette. Dithering routines can make the number of colours appear greater by fooling the eye into mixing 2 adjacent colours together to make a third. But what the heck – even if you can't have all 16 million at once, the quality of 24-bit can still be great!

Lastly, the multi-sync question. If you buy a multi-sync monitor which can accept composite video then why not just use a domestic VCR as a tuner and take the separate audio and video lines to the monitor? Voilà, instant telly! ***GW***

HAMMING IT UP



I read with great interest your article in the January issue of *Amiga Shopper* concerning HAM radio on the Amiga. What I would like to know is whether it is possible to replace the HAM equipment mentioned with a communications receiver (scanner) and drive that use the *AmigaSat* software. It must be possible to connect the scanner to the computer as the manufacturers of the unit used to sell a package that allowed the unit to be connected and controlled by a BBC Micro via an RS232 interface (the control software was supplied on an EPROM). This pack is unfortunately no longer available but I'd still like to know whether I could use this pack on the Amiga using a BBC Emulator. Failing this, do you have any ideas how I could get the scanner working on the Amiga?

Wilfred Salt
Thornaby

Looking at the specification sheet you sent me, I have no doubts that the scanner could be used on the Amiga (for those of you who are interested, it's an AR2002 which is distributed in this country by Lowe Electronics Ltd which can be contacted on ☎ 0629 2817). Although the unit uses a rather unconventional serial connector, it wouldn't be that hard to make up a lead to interface the Amiga to the scanner. I'm sure that just about any computer dealer worth their salt would be able to make up the lead for you as long as you supplied them with the appropriate pin information.

Software wise, unless you could get Lowe to supply you with the controller program on floppy disk, you most certainly couldn't run it under the BBC Emulator simply because there's no way you can connect and use BBC Eproms on the Amiga. Writing your own software wouldn't be that hard though – as long as Lowe supply you with detailed information on how the scanner communicates with a computer, it would only be a matter of writing some software to interpret the information received by the Amiga from the scanner via the serial port. ***JH***

Because of the width of the columns, we occasionally have to break listings across two or more lines. Where this has occurred, and you should enter two or more lines without a [Return] between them, we have used the following symbol: ↵

NIL, NULL, NIENTE, NOWT



When I finally plucked up the courage to try your new startup-sequence in Issue six, it was looking great until a system requester appeared saying, "Please insert volume NIL in any drive". What is it I have done wrong? If I name the Workbench 1.3 copy, "NIL", it loads fine. When I cancel the request, what looks like a CLI page disappears and the normal Workbench screen appears.

A Wallace
West Lothian
Scotland

What an odd conundrum — but give yourself a pat on the back for figuring out at least one way round it. It's always encouraging to receive letters from beginners who have managed to solve problems themselves – by fair means or foul – and decided not to throw the towel in. However, there's no reason not to ask for help when you're completely stuck, and I'd be the first to admit this is a tricky problem.

The word "NIL" appears three times in that Startup-sequence and any one could be the culprit. I suspect you might have used a figure "1" instead of the letter "I"; the two look very similar. NIL is an automatic dummy device (like a disk drive) and is present from the moment the machine boots. A more common mistake is to omit the colon (:) after the device name but if you had done that, the error would not have occurred. The worst you could have got is "Volume Workbench 1.3 is write protected". If this problem is still troubling you, drop a copy of the disk to me c/o *Amiga Shopper* and I'll attend to it personally. ***MS***

JARGON BUSTING • JARGON BUSTING

CIA – Complex Interface Adaptor. The two user-programmable input/output ports. They are used to control the serial and parallel ports, the keyboard and disk drives.

ECS – Extended Chip Set is the name given to the new versions of the Amiga's custom chips which handle graphics and sound.

Kickstart – The most basic and central part of the Amiga's operating system. These days it is held in ROM, so that it is immediately present when the machine is switched on.

NIL – A pseudo AmigaDOS device. Any output sent to NIL disappears without a trace, which is useful sometimes for hiding the output from a command from an unsuspecting user.

Pixel – A picture element - one of the thousands of tiny rectangles that make up a computer screen. A pixel is the smallest addressable area on the screen, so a screen's resolution is measured in terms of number of pixels displayable across by number of pixels down.

RS232 – A standard serial interface port, used for communicating with other computers, connecting printers, and connecting to modems.

24-bit graphics – Normally, the Amiga uses between one and five bits (binary digits) to store the colour of each pixel (picture element) of a display. This means that between two and 32 colours can be displayed. Boards which use 24 bits per pixel, giving a possible 16.7 million colours.

THE CHIPS ARE DOWN



When I connect my printer (Star 24-pin) and disk drive to my Amiga, the disk drive will not work. Both work independently. The computer has been tested by Silica but itfound nothing wrong!

A Pitchley
East Dulwich

You almost certainly have a problem with one or both of the CIA chips in your Amiga. These control the external periperhals (including the drive and the printer) and are very easily damaged (particularly by plugging or unplugging things when the computer is on). They cost around £10-12 each and can be bought from most Amiga dealers. ***JR***

CUB MONITOR USE



I have a Microvitec CUB 1431/MZ colour monitor which has dual RGB inputs as follows: Sinclair Spectrum interface and TTL. I used my Spectrum with this monitor. Could you tell me if it would be possible to feed a composite video signal to the monitor from either a camera or VCR? Would it be necessary to modify the CUB or build a separate interface? Hope you can help.

PW Lee
Coulsdon
Surrey

The short answer to this is yes – you'll either have to modify the monitor or either buy or build an interface to convert composite video to RGB. All of which seems rather desperate. Microvitec ☎ 0274 390011 suggested you try calling a company called Hart Shorn Wells International ☎ 0332 766986 which apparently used to sell composite video to RGB converter kits for Microvitec monitors and which may be able to help. ***GW***

KICKING IT ABOUT



Can you tell me where I can get my hands on a board for my Amiga 500 which will allow me to plug all three Kickstart chips (1.2, 1.3 and 2.0) into my Amiga at once and then switch between them whenever I want? I

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MONITORS

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WARNING: Before you purchase a monitor make sure it has a full UK specification. You might be buying what you think is a similar monitor at a lower price but it is likely to be a "GREY" import. These monitors do not comply with British safety standards and are not covered by an official warranty

New Protar Stereo colour monitor

This monitor uses the same tube as the Philips 8833 MK2 and has the same specification. The Protar comes with a **full 12 month replacement guarantee.** This must be the best value medium res. monitor on the market. **Amiga cable included. Tilt and swivel stand only £11.99 when purchased with this monitor. Cover only £5.99**

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have quite a bit of old software that doesn't work under 1.3, let alone 2.0, but I'd still like to run both of these OS versions as well as my original 1.2 OS.

A company called Pheonix does a double one and so do Accelerators Unlimited (which is supposedly keyboard switchable), but I can't seem to be able to source a triple unit. I thought about buying all the parts and knocking the thing up myself, but I just wouldn't know where to start. Can you help? Failing that, any chance of a DIY project along these lines?

MS Smith
Hereford

You're in luck! Such a device does indeed exist and the company you need to talk to is BlitSoft on ☎ 0908 666265. ***JH***

IS PLUS A MINUS?

I was about to buy myself an Amiga A500 Cartoon Classics pack when I read about the new A500 Plus. Now I'm puzzled about which one to get. Can you help me with the following:
a) Is the A500 Plus compatible with A500 hardware (external drives, printers, genlocks, digitizers, Action Replay and so on)?
b) What kind of software is incompatible with the A500 Plus? Is it utilities, older games – do you have any general guidelines?
c) If I get a Kickstart ROM sharer with the Kickstart 1.3 chip will the A500 Plus be just the same as an A500? Will a ROM sharer invalidate the warranty? Will I have to take the machine apart each time I want to change the ROMs?
d) Will I only need the ROM sharer to play older games? That's what the advert claims.

John Doe

a) The new machine should be compatible with all external hardware except perhaps some designs which hang on the expansion bus. Anything fitted at the back (samplers, MIDI ports and so on) should be OK – provided the software driving it is compatible.
b) Mostly old games and demos, although there are a few problems with some serious software. *Pen Pal 3*, for instance, doesn't work on a Plus unless you have expansion RAM fitted to the 86-pin connector. This has been remedied and the update is free to registered users. Curiously, this also works in reverse. Early versions of *Wordworth* required at least 1Mb Chip, preferably 2Mb, before they would import more than a couple of images.
c) Let's get something straight about ROM sharers. First, they will invalidate your warranty and the A500 Plus is going to be an expensive machine to fix at the moment. Second, most problems I have come across are caused by hardware incompatibility when programmers "hit the metal". The downgrade Kickstart will have no affect on that situation whatsoever. In my opinion, ROM sharers went out with Kickstart 1.3 and should stay buried.
d) Games? What? This is *Amiga Shopper* – and we're all very serious here. Seriously, a lot of older games won't run because of the hardware problems. It's just the price we have to pay for better hardware, software and a greatly improved machine. I'm all for it. ***MS***

JARGON BUSTING • JARGON BUSTING

ARP – AmigaDOS Replacement Project. The MicroSmith's version of AmigaDOS - thought by many to be better than AmigaDOS, and certainly more friendly in many respects. Now, with the advent of Workbench 2, it has become largely obsolete.

CLI – Command Line Interface (nowadays replaced by the more powerful Shell equivalent) is provided to enable users to sidestep Workbench and use AmigaDOS commands directly using the keyboard in a manner similar to users of MS-DOS or Unix.

Digitiser – A device which takes the analogue information taken by a source such as a video camera and converts it to digital screen information for use by a computer.

RAM disk – An area of memory that is treated as if it were a floppy disk. The advantage is that files can be stored and retrieved much more quickly, though all information is lost when the power is switched off.

ROM sharer – A device which will hold more than one ROM (the chip in which Kickstart is stored) and enable the user to choose which version to use.

Scanner – A device which converts an image on paper into a digital form suitable for the computer. The digital image can then be used in a paint package such as *Deluxe Paint*. Unlike a hand scanner, a flatbed scanner works in a similar manner to a photocopier,in that the image to be scanned is placed on the machine and scanned automatically.

NO SCAN

I can get my hands on a flatbed IBM MS300A scanner. Is there any way to run it on my Amiga 500?

Robert Erbe
Witney
Oxon

No, not unless you fancy writing some Amiga software to work with it. On the other hand I guess it might work with a hardware PC emulator, but without actually having the emulator, the scanner and the software I can't be sure. The emulator manufacturers may know; contact Bitcon Devices ☎ 091 490 1919. ***JW***

OPUS ANSWERS

I recently bought a copy of INOVAtronics' *Directory Opus* utility for my Amiga 500 but alas I am having problems with it – to be more precise, I can't even get the damned thing to run!

According to the manual it requires access to an ARP library. Bearing this in mind, I attempted to copy ARP on to my work disk from the CLI but I got an error message informing me that AmigaDOS 'Couldn't Open LIBS/ARP for input – Can't find object' or words to that effect. I then copied the ARP library using *SID* on to my working copy of Workbench 1.3.2 which I used to boot up my machine. I then inserted the *Directory Opus* disk , clicked on the Opus program icon and waited for the program to load. Even then, all I got was a recoverable alert informing me that 'You must have ARP library to use Directory Opus'. Why isn't the ARP library on my boot disk being accessed? Where am I going wrong?

The manual also claims that I can run *Directory Opus* from either the Workbench, the Shell and even the startup-sequence. I've added *Directory Opus* to my startup-sequence as instructed, but still no joy! What do I do next?

J Lejey
Newport

It sounds to me as if you've stumbled across one of the most frustrating problems that many Amiga users eventually encounter. Everyone can copy programs and their associated files when they have icons, but things can get very hairy indeed if you have to start messing around with 'hidden' files like the ARP library. To make matters even worse, files like ARP have to be placed in exactly the right place if the operating system is to know where to find them.

All 'library' files have to be installed into a logical device called 'LIBS:' which usually resides on your boot disk in a directory called Libs (logically enough). Logical devices are really nothing more than pointers that tell the operating system where it can find certain files. Simply by changing these 'pointers' (using the 'Assign' command), you can tell the system to look somewhere else for its system files.

It sounds to me as if you still haven't installed the ARP library correctly on your boot disk. You can check this using *SID*. Once *SID* is running, insert your boot disk (Workbench 1.3.2) and then get a directory listing of the disk by clicking on the 'DFO' gadget. Once the listing appears, click on the directory called 'Libs'. After a few seconds, you should have a listing of the contents of your boot disk's Libs directory. If ARP has been installed correctly, you should see a file called 'arp.library' somewhere in that directory listing.

If it isn't there, then remove your Workbench disk, insert the Opus disk, enter Opus' Libs directory and copy 'arp.library' into the RAM disk and then re-insert your Workbench disk, enter its Libs directory and copy ARP across. You should now have ARP installed correctly.

You may also want to check that the startup-sequence of your boot disk doesn't reassign LIBS: to somewhere else on your boot disk. I very much doubt if it does, but then you never know. If you do see a line that says something like 'Assign LIBS: xxxx' (xxxx being a pathname for a directory) then copy the ARP library into that directory instead. ***JH***

KEYS TO SUCCESS

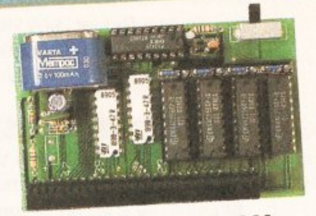
I have an Amiga with a German keyboard, plus one external drive. Due to an accident I corrupted the startup-sequence on my German Workbench 1.3 disk. How can I edit the startup-sequence of the German Workbench with the UK Workbench? I also have a copy of Workbench 1.2 which works fine, but after using it I have to switch the machine off for 30 seconds or the startup-sequence of the next disk I insert is corrupted.

Martin Houghton
BFPO, Germany

I assume you want to replace the startup-sequence of your corrupted disk with the one from the UK disk. (Some readers might be interested

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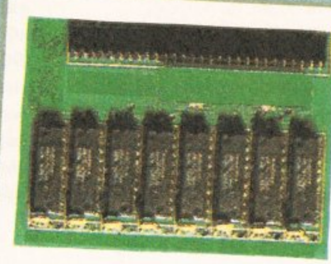
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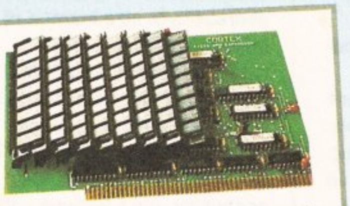
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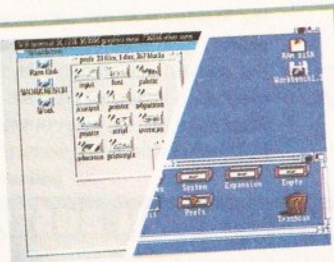
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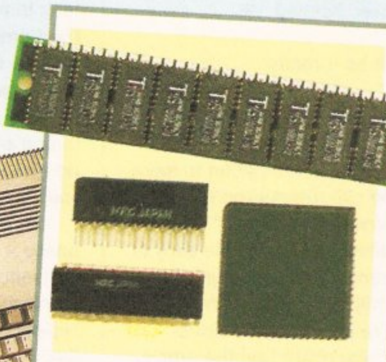
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to note the German Amiga keyboard is considerably different to the UK version to account for special accented characters). Actually, if that's all you want to do, all that's necessary is to correct the keymap setting. Here's how:

1 Make a copy of your UK Workbench disk.
2 Boot the copy of the Workbench 1.3 UK disk.
3 Pop your Extras 1.3 disk in the external drive. (If you've lost it, the original German Workbench will do if its still readable.)
4 Open a Shell (double click on its icon).
5 At the prompt (1.SYS) enter:

```
COPY DF1:DEVS/Keymaps/d TO ↵
DEVS:Keymaps
```

Now enter this:

```
ED S:Startup-sequence
```

Move the cursor to line which reads:

```
SYS:System/SetMap GB
```

and alter it so it reads:

```
SYS:System/SetMap D
```

Use the [ESC-X] combination to save the file and exit. (Press the escape (esc) key once, then press "X", then [Enter].) Now reboot from the copy of the Workbench disk and your keyboard will behave as it should. While you're on with the Startup-sequence, you might find the article in *AS 6* useful since it shows how the startup works and how to hone it for speed and performance.

The problem with the 1.2 Workbench sounds like an ancient virus – possibly BSG9 or IRQ – but it could be a later one. The best solution is to get a decent virus killer and disinfect your disks. ***MS***

WHICH MONITOR?



I own an A500 which I plug into a portable TV and I also have a 286 IBM-compatible PC with a colour SVGA monitor. I am going to have to buy some kind of monitor for the A500 as I find character definition so bad that after a while I get a headache.

I therefore have some questions with regard to monitors:
a) Is it possible to use the SVGA monitor with my Amiga if a buy a flicker fixer and connecting lead?
b) Another alternative is a Commodore monitor. When the costs of both alternatives are added up I think that they will be approximately the same (as I will have to add a sound option of some sort to option (a)) but a major consideration is that of space. Will a Commodore monitor result in a better or worse picture than option (a)?
c) If I purchase a portable TV with a SCART socket and connected my Amiga into this what quality picture would result compared to options (a) and (b)? Am I right in thinking that I would also need a sound system for this method?

Bill Lewis
Rugby
Warwickshire

a) The simple answer to this is yes – but obviously ensure that the flicker fixer is one which is suitable for the Amiga 500, such as the ICD Flicker Free Video card.
b) With flicker fixers currently costing considerably more than £200 you will perhaps want to get something more for your money than a plug-in card. If you *can* find the space you may find that adding a TV monitor (see below) would be the best compromise, since you'll have sound as well as vision. The quality will be less than the SVGA option (as would the Commodore option) but you'll gain an extra TV. If you can stand the flicker (which most people get used to quite quickly) this will be a good option and will be far superior to the portable TV (and modulator?) that you currently use.

And if you really are short of space it may be worth thinking about a monitor plinth so that you can stand the monitor above your A500. Typical cost would be around £30 – £40.
c) With a good SCART TV you will probably get quality superior to that produced by a Commodore monitor but inferior to a multi-sync and flicker fixer. Assuming that you have the right SCART lead for the TV there should be no need to add an extra sound system. ***GW***

MEMORY SWITCHING



I have an old A501 memory expansion unit, and I wish to add a disable/enable switch to it. Please could you tell me the pin(s) to connect to and/or the pinout values of the unit.

I Gill
Huddersfield

The pin-out information for the A501 connector is shown in the back of the Amiga 500 manual. To disable the A501 cut the EXRAM line on the board (and solder a switch across it so you can enable it again!).

Firstly, rip off the metal shielding from your A501 board. You don't actually need this; it's purely to prevent the A501 giving out RF emissions (which is strictly controlled in the States). Looking at the bottom of the A501 board, there are two long rows of solder lumps which are the legs of the connector that fits into the A500. Look at the row nearest the edge of the board. Holding the board so this row is at the top (and the chips are facing away from you) counting thirteen pins along from the left, you should see a small track leading from that leg to a larger strip on the board. Cut that small track and solder two wires, one to that pin and one to the second pin from the left (this is the pin that the larger track is connected to).

Solder the other two wires to a small single pole single throw switch and you can switch the A501 on and off (but the clock will always work, which can be handy). ***JR***

THAT'S RICH!



At work I use an IBM PC and *DisplayWrite 4* word processor, and I want to be able to do some work at home.

I have installed *MessyDOS* and so far I have been restricted to ASCII transfer between the PC and *Protext 4* on the Amiga 1000. This is a pain when it comes to reading the file back into *DisplayWrite 4* as I have to re-insert page ends, bold, etc, etc, and on a 25 page document this is no fun at all.

One way around this, as I see it, bearing in mind that the hardware IBM emulators don't seem to work on the Amiga 1000, is to find an Amiga word processor which can import or convert Revisable Text Format files. *DisplayWrite 4* can convert its own documents to this format, and vice-versa.

Preliminary enquiries to advertisers suggest this is not possible. Can you suggest anything?

PA Branningan
Middlesbrough

Hmmm, never heard of Revisable Text Format. I think you mean Rich Text Format. And if you do mean this, then you're in luck because version 5.5 of *Protext* can convert RTF files into its own format, and vice-versa. Contact Arnor ☎ 0733 68909 for *Protext* upgrade prices. ***JW***

QUESTIONS, QUESTIONS..



a) What are the differences between CAD and structured drawing packages?
b) Which, if any, PD or commercial CAD structured drawing packages will work properly with Gold Disk's *PageSetter 2*? I was wondering if New Horizons' *DesignWorks* would be suitable.
c) What is the difference between Compugraphic and outline fonts?
d) What is a colour font and how are they different from other types of font? Can they be used in normal graphics or DTP applications?
e) When I select 'OverScan' from within *Photon Paint*, the screen decreases in size instead of increasing. Why is this?
f) My Amiga has an internal 1.5Mb RAM expansion (strapped to the Gary Chip via a piggy-back connector). If I add further RAM via the Amiga's bus connector, will I encounter any problems with the extra RAM configuring correctly?
g) My machine keeps crashing! Is this due to a lack of memory or undue strain on the power supply? I have two external drives attached to my machine.

Anon

a) Both CAD and structured drawing programs use exactly the same technique to handle images. Packages like *DPaint* work at pixel level which means that the quality of the images that you can create are severly restricted by the resolution of the computer's screen – ie, a low resolution image will remain low resolution even if you convert it to high resolution using something like

continued on page 62

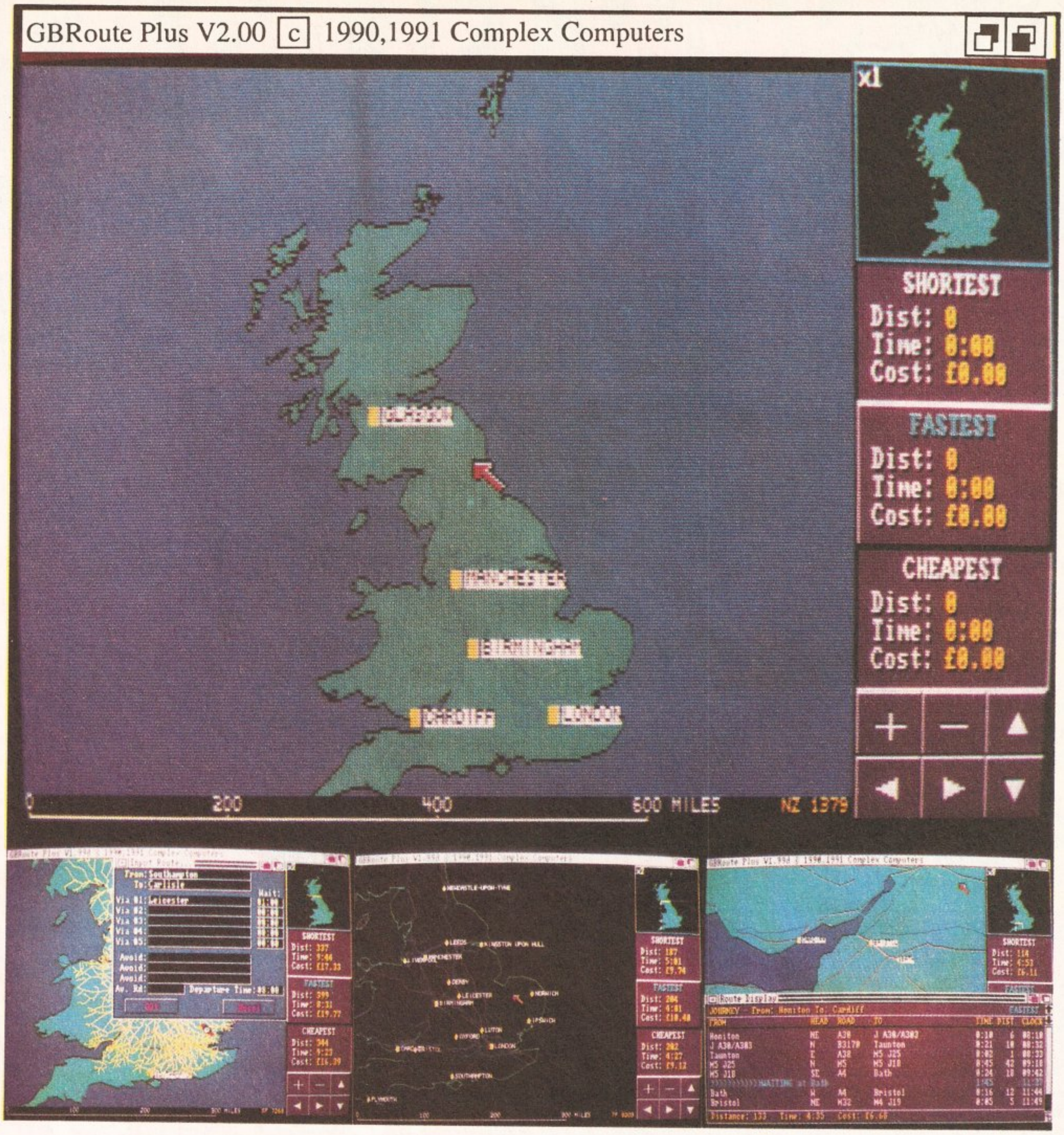
JARGON BUSTING • JARGON BUSTING

CAD – Computer Aided Design programs provide designers with the graphical facilities to design buildings, circuit boards, and so on. Rather than working with bit-mapped images, the graphics are stored as a series of vectors.

MessyDOS – A program which enables the Amiga to read and write to IBM PC format floppy disks. This does not mean that it can run PC programs, but simple text files stored in the ASCII standard can be transferred and used without major problems.

SVGA – Super Video Graphics Array is an IBM PC graphics standard which provides high resolutions with up to 256 colours on screen at once. Monitors are available which are specifically designed for use with SVGA graphics cards.

Virus – A small program that can lie hidden in memory or on a disk, duplicating itself on to any disks inserted in the machine, and generally causing havoc. There are many virus killers available in the public domain designed to deal with this menace.



GBRoute Plus

Route Planner for the Amiga

£79.95 Inc Vat

1 Meg Required

£79.95 Inc Vat

1 Meg Required

GBRoute Plus for the Amiga computer has been carefully designed to assist the United Kingdom motorist plan easily and efficiently journeys almost anywhere in the UK. GBRoute Plus will not only find routes but will also cost, time and distance a journey in a matter of seconds, allowing the user to then print out a route or graphical map in either black and white or colour. There are many other features within the software designed for ease of use many of which allow the user to customise the program to suit the individual driver.

Features include:-
* Over 25 Million possible routes
* Calculate shortest, fastest and cheapest routes
* Includes Motorways, A roads and B roads
* Includes Cities, Towns and many Villages
* 5 Via options, 3 Avoid places and avoid road
* Colour and wireframe map graphics
* Interlace display
* Supports colour and black and white printers
* Map scrolling and zooming facilities

Features Include:-
* Motorway service stations included
* Road Bias facility for six classes of road
* 10 levels of magnification to a 1 mile scale
* Mileage scale bar
* National grid coordinates
* Colour palette requester
* ARexx support - over 50 commands
* Vector mileage calculator
* 3D look user interface

Dealers Contact:
1. Leisure Soft
2. HB Marketing
3. Laser Distribution
4. Centresoft/IBD
5. SDL

GBRoute Plus is available from most good Amiga dealers

Telephone: 0706 224531 - Fax: 0706 225320
Complex Computers-2 The Arcade, Waterfoot, Rossendale, Lancs BB4 9AF

CARTOON CLASSICS MEGA 31*

AMIGA A500 PLUS

New GORDON

31* MEGA GAME 1Mb

HARWOODS POWERPLAY PACK 1 COMES OF AGE WITH 31* GREAT GAMES & A 1Mb AMIGA A500 PLUS CARTOON CLASSICS WITH THE SIMPSONS, LEMMINGS AND CAPTAIN PLANET PLUS 28* EXTRA GAMES ONLY FROM HARWOODS!!!

ALL OUR AMIGAS ARE UNITED KINGDOM SPECIFICATION AND INCLUDE THE FOLLOWING...

1 Mb. Disk Drive
1Mb Ram Memory
TV Modulator
4096 Colours
Multi Tasking
Speech Synthesis
4 Channel Digital Stereo Sound
Amiga Mouse
Operation Manuals
Workbench 2 Disks
ALL Connecting Cables

PLUS...All OUR Amigas are backed by Harwoods Great Service

[Please see full details in our Ordering Made Easy' panel final page]



MEGA 31* AMIGA 1 PACK 1 POWERPLAY

THAT'S RIGHT HARWOODS HAVE PUT TOGETHER THE ULTIMATE AMIGA PACKS YET AGAIN... STARTING WITH POWERPLAY PACK 1 WHICH INCLUDES 31* GREAT GAMES!

Just look at what you get NOW...

Our packs always contain Professional Games NOT PD or multi-game disk titles

- **AMIGA A500 PLUS COMPUTER WITH A FULL 1Mb. OF MEMORY!**
- **THE SIMPSONS, BART vs THE SPACE MUTANTS** - Thats right man! you can play the computer version of this popular TV cartoon. By Ocean.
- **CAPTAIN PLANET** - created from the award winning TV show, now's your chance to save the earths environment with this ultimate adventure... your Eco-Copter is waiting. By Mindscape.
- **LEMMINGS** - Are you as smart as Lemmings are stupid, match your intelligence against their lack of it as you play the 140 levels of the most original game of '91 (European Computer Leisure Awards Winner). By Psygnosis.
- **EDUCATIONAL BASIC LANGUAGE** FOR CREATING YOUR OWN PROGRAMS
- **DELUXE PAINT III** GRAPHICS PACKAGE WITH ANIMATION
- **TAILORED DUST COVER AND MOUSE MAT**
- **AND A SUPERB HIGH QUALITY MICROSWITCHED JOYSTICK,**
- **PLUS.... 18 MORE GREAT GAMES,** THERE'S SOMETHING FOR EVERYONE...

BLOODWYCH - Fantasy role-playing game, great interaction with your computer created environment
BUBBLE+ - Help the dawdling ghost and the soap bubble, escape from the old deserted manor house
CAPTAIN BLOOD - Astonishing creatures and animated 3D graphics, this is a game you just have to play
ELIMINATOR - A progressive multi stage flying shoot 'em up, on a long winding course, survive if you can!
HOSTAGES - You must get your team and hostages out of the terrorist overrun embassy, without loss of life
JUMPING JACKSON - In a deluge of colour and sound save, the earth from sadness and melacholy music
KRYPTON EGG - A classic Breakout game, 60 screens, separated by 6 combat sequences
LANCASTER - Your mission is to fly the classic WWII bomber on its dangerous raids over enemy territiory
LOMBARD RAC RALLY - You drive your 300 bhp Sierra Cosworth through demanding stages of the rally
PURPLE SATURN DAY - Four arcade games, an exciting high speed trip into total cosmic 3D space
SAFARI GUNS - Live the African experience in an animal sanctuary, track the poachers & ivory traffickers
STIR CRAZY (Featuring Bobo) - Bobo & his inmates are planning a stunning trampoline jump prison escape
SKYCHASE - Airborne combat for every simulation fan. In this one or two player game, battle against your MIG flying adversary in your F-16 Falcon.
SKYFOX II - Skyfox II, the only ship fast enough to carry on the Skyfox legend. Fight to blow your federation enemies from the Galaxy, at speeds of 9000 kilometres/second!
STRIKE FORCE HARRIER - Puts you in the cockpit of one of Britains most exiting fighter aircraft. Multiple skill levels let you progress to become an ace pilot
TINTIN ON THE MOON - We've been captured by Colonel Jorgen and he's tring to scupper the moon mission. Come on Tintin, you're the only one who can save us, and be the first on the moon
TV SPORTS FOOTBALL - Strap on your helmet for American football simulation that looks like the real thing.
XENON 2 MEGABLAST - This time it's war! The Xenites are back and have thrown time itself into turmoil.

We reserve the right to substitute individual software titles or pack items should the need arise.

CARTOON CLASSICS MEGA 31* AMIGA A500 PLUS

BUY YOUR AMIGA WITH 2Mb FOR ONLY £40 EXTRA!!! (ie.1Mb RAM Expansion)

See Page 4 overleaf for details

*** OUR POWERPLAY PACK 1 PREVIOUSLY CONTAINED 21 GREAT GAMES BUT, NOW WE'RE INCLUDING THESE 10 FANTASTIC BONUS GAMES... ...BUT ONLY WHILST STOCKS LAST!**

DATASTORM - The fastest shoot 'em up of all time! Defender with a vengence!!!
DUNGEON QUEST - Ultimate in multisensory gaming! The BEST graphic mysteries!
E-MOTION- 50 levels of multi-coloured puzzles. A challenging emotional experience.
GRAND MONSTER SLAM - Elves, Trolls, Goblins, Orcs, Dragons & Knights do battle!
RVF HONDA - Formula 1 motorbike racing at 170mph on a Honda RC30 racing bike!
DRIVIN' FORCE - For driving maniacs! 12 competitions day or night with 6 vehicles!
PIPEMANIA - Classic puzzle arcade game. So addictive you won't want to put it down!
ROCK 'N' ROLL - Crazy action game accompanied by fantastic Rock 'n Roll sounds!
SKWEEK- Paint the town PINK, kill Schnoreuls and dominate 99 levels of Skweezland
TOWER OF BABEL - Intricate 3D strategy game. Fantastic lighting & shading effects!

...AND HARWOODS ALSO GIVE YOU A SUPERB BROCHURE OFFERING UP TO 16 NIGHTS FREE HOTEL ACCOMODATION IN AN EXTENSIVE SELECTION OF 400 HOTELS AROUND THE UK PLUS NOW A SPECIAL BUDGET FRANCE SUPPLEMENT IS INCLUDED TOO!

Priced at an INCREDIBLE

£399.95 Including VAT

Finance terms are available (subject to status) for most products; please see our ordering panel at the end of this advert for full details

HARWOOD

POWERPLAY PACKS

All our packs contain the new Amiga A500 Plus.
(1.3 Amigas may still be available to special order, please enquire.)

HARWOOD'S BRILLIANT 1Mb AMIGA 500 PLUS 'MEGA 31*' GAMES PACK 2

MEGA 31*

POWERPLAY

That's right you get the fantastic Amiga & **ALL THE EXTRAS** detailed in Harwoods "Mega 31*' Pack 1 AND you also get...

THE PHILIPS CM8833/II STEREO COLOUR MONITOR

MONITOR PACK 2

PACK TWO

OR...YOU CAN CHOOSE A PHILIPS MONITOR TV AT NO EXTRA COST! See page 6 for FULL details of this remarkable Fast Text Monitor TV

A SPECIAL PACK FROM HARWOOD'S YOU SEE AND HEAR THOSE GAMES WITH SUPERB CLARITY

Our monitor section on page 6 gives full details for your choice of Philips Monitors & Monitor TV's

£629.95 Including VAT

BUY AN AMIGA WITH 2Mb FOR ONLY £40 EXTRA!!! (ie. 1Mb RAM Expansion included)

HARWOOD'S GREAT 1Mb AMIGA 500 PLUS 'MEGA 31* 'PACK 3

MEGA 31*

POWERPLAY

That's right you get the fantastic Amiga & **ALL THE EXTRAS** detailed in Harwoods "Mega 31*" Games Pack 1 (far left) AND... then you also get...

THE SUPERB PHILIPS CM8833/II STEREOCOLOUR MONITOR

Our monitor section on page 6 gives full details for your choice of Philips Monitors & Monitor TV's

MONITOR AND PRINTER PACK 3

PACK THREE

OR...YOU CAN CHOOSE A PHILIPS MONITOR TV AT NO EXTRA COST! See page 6 for FULL details of this remarkable Fast Text Monitor TV

Plus...

THE SUPER STAR LC 200 COLOUR PRINTER...

Featuring...
185/40 cps, Full Colour 9 Pin NLQ Dot Matrix Printer with a FREE Dust Cover and cable to your Amiga.
(See printer panel for details)

IF YOU WISH, REPLACE THE LC200 WITH A CITIZEN SWIFT 9 COLOUR AT NO EXTRA COST!!! OR... IF YOU PREFER A 24PIN COLOUR PRINTER, JUST CHOOSE FROM OUR RANGE & ADD THE DIFFERENCE IN PRICE BETWEEN STARS LC200 & 'YOUR CHOICE'. (eg. Citizen 224, add just £50)

£829.95 Including VAT

"IT'S THE-BUSINESS"

CARTOON CLASSICS

POWERPRO

A TRULY PROFESSIONAL PACKAGE SPECIFICALLY FOR THE BUSINESS MINDED AMIGA USER. THIS ONE SHOULD FULFILL EVERY AREA OF HOME BUSINESS YOU'RE LIKELY TO NEED!

POWERPRO PROFESSIONAL PROFESSIONAL PROFESSIONAL PACK

THE BUSINESS PACK FROM HARWOODS INCLUDES ALL THE FOLLOWING...

AMIGA 500 PLUS WITH 1Mb. MEMORY
+
PHILIPS CM 8833/II STEREO COLOUR MONITOR
See Monitor Panel on Page 6 for Details
+
STAR LC200 9 PIN NLQ FULL COLOUR PRINTER
See Printer Panel on Page 5 for Details
+
A HOST OF BUSINESS SOFTWARE & ACCESSORIES...
PEN PAL V1.3 (Word Processor)...1Mb.
SUPERBASE II PERSONAL (Database)
SUPERPLAN (Spreadsheet)...1Mb.
+
A GREAT TEN GAMES PACKAGE

Datastorm, Drivin' Force, Pipe Mania, Dungeon Quest, Rock-N-Roll, E-Motion, Tower of Babel, Skweek, RVF Honda, and Grand Monster Slam.

OR...YOU CAN CHOOSE A PHILIPS MONITOR TV AT NO EXTRA COST! See page 6 for FULL details of this remarkable Fast Text Monitor TV

BUY AN AMIGA WITH 2Mb FOR ONLY £40 EXTRA!!! (ie. 1Mb RAM Expansion included)

IF YOU WISH, REPLACE THE LC200 WITH A CITIZEN SWIFT 9 COLOUR AT NO EXTRA COST!!! OR... IF YOU PREFER A 24PIN COLOUR PRINTER, JUST CHOOSE FROM OUR RANGE & ADD THE DIFFERENCE IN PRICE BETWEEN STARS LC200 & 'YOUR CHOICE'. (eg. Citizen 224, add just £50)

Plus...

- THE SIMPSONS
- CAPTAIN PLANET
- LEMMINGS
- DELUXE PAINT III Now with ANIMATION
- MICROSWITCHED JOYSTICK
- 10 BLANK 3.5" DISKS
- DISK LIBRARY CASE
- MOUSE MAT
- 3 TAILORED DUST COVERS

ADD A CUMANA CAX 354 SECOND DRIVE FOR JUST £50 TO HELP RUN THOSE BUSINESS PACKS MORE EFFICIENTLY

WE MEAN BUSINESS AT A GREAT PACKAGE PRICE OF JUST...

£899.95 Including VAT

HARWOODS LEARN & PLAY

PRIMARY & JUNIOR PACK A

EDUCATION

Get your children off to the right computing start with this software learn and play pack...

PROF. PLAYS A NEW GAME
PROF. LOOKS AT WORDS
PROF. MAKES SENTENCES
PROF. HUNTS FOR WORDS

Active, enquiring young minds love seeing the cartoon character called Prof. entertain and teach. Children take charge of Prof. on the computer, active learning. Follows National Curriculum(N.C.).

HOMEBASE

Ideal home storage system. Keep household lists, student records etc. Easy to use "push button" controls.

PRIMARY MATHS COURSE

Around 24 modules in this course from 3 yrs old right up to secondary level. Follows N.C.

READING & WRITING COURSE

24 module course. Teaching from the computer and books. For early starters & the dyslexic.

LESSON A — EDUCATION — A — PACK A

A GREAT EDUCTIONAL PACK FOR YOUR CHILDREN AT A FRACTION OF THE NORMAL COST

£89.95 Including VAT

HARWOODS LEARN & PLAY

GCSE/'O' LEVEL PACK B

EDUCATION

GCSE examination level studies on your Amiga computer that's fun!

MICRO ENGLISH, MICRO FRENCH AND MICRO MATHS

A set of three complete self-tuition courses to GCSE level which can also be used for revision work. All programs adhere to the National Curriculum and were designed and tested in schools by professional teachers. Micro French includes "real speech" to help your accent!

PEN PAL- Graphical Word Processor

A fantastic word processor with all the tools you'll need to create effective written work. Ideal for home work, projects etc. or for the families letters. Text wraps automatically around graphics, even as you type! Includes a built-in database and Forms Manager.

HOMEBASE

Homebase is the ideal information storage program for things like household lists, student notes, and children's educational projects. Inc. clearly labelled "push button" controls and clear comprehensive reference manuals.

LESSON B — EDUCATION — B — PACK B

A GREAT EDUCTIONAL PACK FOR YOUR CHILDREN AT A FRACTION OF THE NORMAL COST

£89.95 Including VAT

Enquiries & Order Line:
0773 836781

Finance Facilities Available*
Please phone us for information and your personal application pack.

VISA — Access — Switch

GORDON HARWOOD HARWOOD HARWOOD Computers

ALFRETON DERBYSHIRE

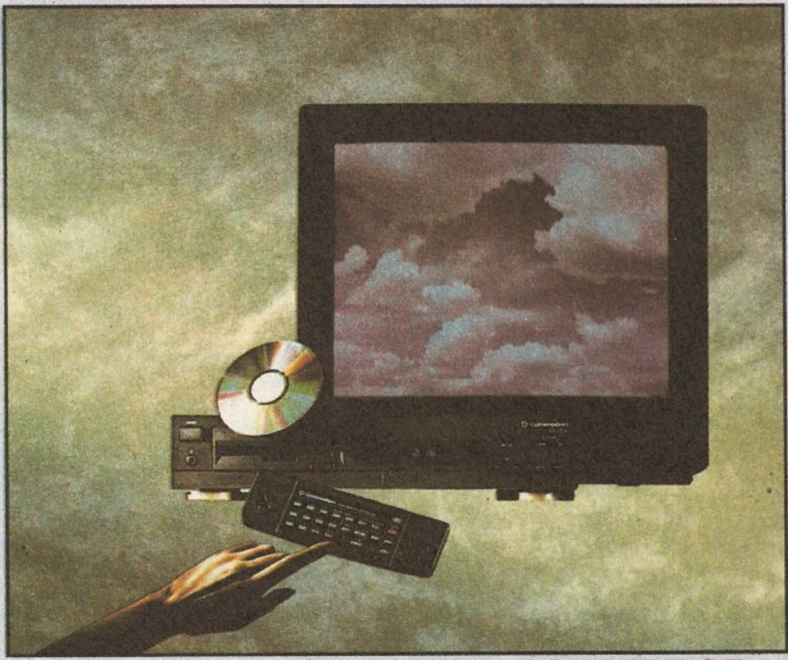
The Closer you look, The Better we look.

Finance terms are available (subject to status) for most products, please see our ordering panel at the end of this advert for full details

SOUND AND VISION

Words and Pictures

CDTV



IMAGINE, IF YOU CAN, THE CONCEPT OF A NEW, MORE POWERFUL AMIGA...

...WITH 1 MEGABYTE OF MEMORY, AND A COMPACT DISK DRIVE OF ALMOST INFINITE SIZE. A DISK DRIVE SO VAST, IT CAN STORE HUNDREDS OF MILLIONS OF DIGITS OF DATA. THIS DATA COULD BE, SPEECH, ANIMATED PICTURES, DIGITISED STEREO SOUND, COMPUTER IMAGES OR WHOLE ENCYCLOPAEDIAS.... AND MORE.

IMAGINE THIS, AND YOU CAN START TO GRASP THE CONCEPT OF CDTV.

THE INTEGRAL COMPACT DISK DRIVE, IS THE KEY TO THE POWER OF CDTV. ITS STORAGE CAPACITY IS EQUIVALENT TO AROUND A QUARTER OF A MILLION FULL PAGES OF TEXT. THIS WHEN INTEGRATED WITH THE 1 MB OF INTERNAL AMIGA CIRCUITRY, CREATES A SYSTEM, WHICH FROM A CD DISK, CAN GIVE YOU ACCESS TO AN UNIMAGINABLE SPECTRUM OF REAL WORLD IMAGES, NEVER SEEN COMBINED BEFORE. THESE VIVID IMAGES, WITH WORDS AND SOUNDS, GIVE YOU A WHOLE NEW DIMENSION IN HOME EDUCATION, ENTERTAINMENT & INFORMATION TECHNOLOGY. AND... DON'T FORGET, THAT CDTV CAN PLAY IN SUPERB QUALITY, ANY NORMAL AUDIO MUSIC CD, AND IT CAN ALSO PLAY THE NEW CD+G DISKS, WHICH GIVE DIGITAL SOUND AND ON SCREEN GRAPHICS.

ON CD DISKS NOW AVAILABLE, THERE ARE EDUCATIONAL PACKAGES, ENCYCLOPAEDIAS PACKED WITH REFERENCE INFORMATION, STUNNING GAMES, MUSIC SYSTEMS AND MANY OTHER NEW AND VARIED SUBJECTS, INCLUDING WHOLE WORLD ATLASES OR EVEN THE COMPLETE WORKS OF SHAKESPEARE, EACH ON ONE CD DISK!!! **CDTV - NOTHING LESS THAN REVOLUTIONARY**

FREE CDTV STARTER PACK!!!

WHEN YOU CHOOSE YOUR CDTV FROM GORDON HARWOOD, NOT ONLY DO YOU GET OUR LEGENDARY SERVICE, BUT WE GIVE YOU A CDTV STARTER PACK, TO GET YOU EXPLORING YOUR NEW WORLD - STRAIGHTAWAY. THIS INCLUDES A SUPERB SELECTION OF CD DISK TITLES INCLUDING THE WELCOME TUTORIAL & HUTCHINSONS ENCYCLOPAEDIA, PLUS ... FOUR GAMES, SHERLOCK HOLMES & THE HOUND OF THE BASKERVILLES, SIM CITY, CHAOS IN ANDROMEDA, AND THE ACCLAIMED LEMMINGS, WORTH IN TOTAL ALMOST £170.00. IN ADDITION IS THE INFRARED REMOTE CONTROLLER, AND ALL THE HARDWARE NEEDED TO GET YOU CONNECTED.

ALL THIS FOR JUST £499.95

CDTV IS THE SAME SIZE AND STYLE AS MOST VIDEO RECORDERS, SO IT CAN SIT UNOBTRUSIVELY ABOVE OR BELOW YOUR HOME TV AND/OR HI-FI. AND WITH ITS INFRARED REMOTE CONTROLLER, IT CAN BE OPERATED FROM YOUR ARMCHAIR. BUT PERHAPS MOST IMPORTANTLY, IF YOU ARE A COMPUTER ENTHUSIAST, REMEMBER THAT INSIDE EVERY CDTV, IS AN AMIGA, JUST WAITING TO BE USED. SO LATER ON, YOU'LL BE ABLE TO BUY THE OPTIONAL KEYBOARD AND DISK DRIVE, TO GET INTO THE WORLD OF AMIGA COMPUTING. PRINTERS, DIGITISERS, GENLOCKS AND OTHER ACCESSORIES,CAN ALL BE CONNECTED TO GIVE ACCESS TO MANY OTHER EXCITING FACILITIES, AND ALSO MANY OF THE EXISTING SOFTWARE PACKAGES AVAILABLE FOR THE AMIGA COMPUTER. NEVER BEFORE HAS THERE BEEN SO MUCH POTENTIAL FROM ONE NEW STUNNING SYSTEM, PACKED WITH **TODAYS TECHNOLOGY.!**

CALL IN AND SEE US FOR YOUR PERSONAL DEMONSTRATION, OR PHONE US FOR YOUR FREE DETAILED CDTV INFORMATION PACK.

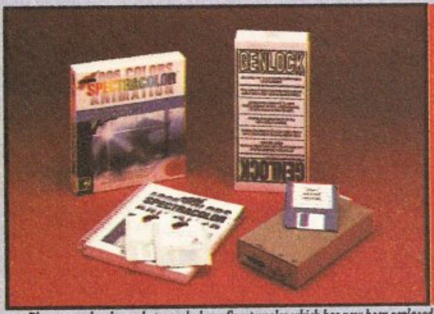
CDTV ACCESSORIES

Please call for latest availability.

CD 1220 KEYBOARD	AN 89 KEY QWERTY KEYBOARD	£49.95
CD 1252 MOUSE	INFRARED MOUSE WITH BATTERY SAVER.	£49.95
CD 1200 TRACKBALL	INFRARED TRACKBALL, WITH THE OPTION OF DIRECT CONNECTION TO EXTEND BATTERY LIFE. DUPLICATES FUNCTIONS OF 2 BUTTON MOUSE & INCLUDES TWO 9 PIN PORTS FOR STD. JOYSTICKS	£79.95
CD 1400 CADDY	FOR HOLDING CD WITHIN DRIVE	£9.95
CD 1401 MEMORY CARD	PERSONAL RAM CARD CONTAINING 64K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV	£79.95
CD 1405 MEMORY CARD	A LARGER PERSONAL RAM CARD CONTAINING 512K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV	£249.95
CD 1800 FLOPPY DRIVE	RACK MOUNTABLE FLOPPY DRIVE WITH 880K CAPACITY. CASING ALLOWS ROOM FOR ADDITIONAL HARD DRIVES OR MODEMS ETC.	£99.95
CD 1301 GENLOCK	PAL BASED VIDEO INTERFACE CARD FOR SUPERIMPOSING CDTV IMAGES OVER A VIDEO SIGNAL PROVIDED BY ANY STANDARD VIDEO SOURCE	£149.95
CUMANA 3.5" DRIVE	CDTV COMPATIBLE AND STYLED IN MATCHING BLACK. (Same spec as CAX 354 on page 4 of this advertisement)	

Many Amiga Accessories & Peripherals (e.g. Printers, Disk Drives, Software etc.) are compatible with CDTV. Please phone us for compatability information.

HARWOODS AMIGA
PRO-GEN
NEW LOWER PRICE



PROFESSIONAL QUALITY GENLOCK FOR COMPUTER AND VIDEO MIXING, AT A DOWN TO EARTH PRICE!!!

Please note the above photograph shows Spectracolor which has now been replaced by Photon Paint 2.0

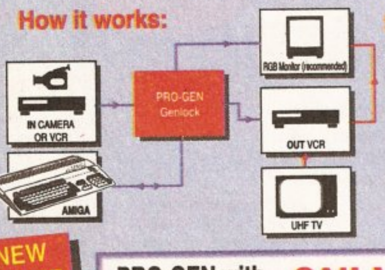
PRO-GEN Amiga Genlock

The Pro-gen AMIGA Genlock allows you to mix your Amiga display with any PAL video signal whether it is from a VCR, Laserdisk player or a Camcorder. In fact any item of video equipment which outputs a PAL composite video signal.Combined with the Amiga computer the Pro-Gen gives you the facilities of a special effects & video titling suite. Take your own films & give them a professional look by OVERLAYING TITLES or by SUPER IMPOSING YOUR OWN GRAPHICS created in packages like Photon Paint 2.0 or Deluxe Paint. Pro-Gen is supplied with micro illusions superb Photon Paint 2.0 package.

FREE

A powerful Lo-and-Hi resolution hold and modify (HAM) paint program, with overscan (NTSC/PAL) and special effects for your Amiga Computer including all the following... **Contour Mapping:** drapes a brush over a 3D "landscape". Pixel intensity values decide the peaks and valleys, while a specially developed ray-tracing algorithm maps the image precisely. **Surface Mapping:** around 3D objects, both geometric and free hand drawn. **Luminance:** sets the light source and intensity. **Shadowing:** automatically with control of size and offset. **Brush Control:** twist, tilt, resize, flip, rotate, bend, adjustable transparency, stretch etc etc. PLUS LOTS MORE! A great program allowing use of 4096 colours. Choice of horiz/vert page print, negatives, anti-aliasing, dithered print, adjustable brihgtness etc.

How it works:



STOP PRESS

PRO-GEN... NOW INCLUDES A VERY VERSATILE MULTI COMPONENT VIDEO TO GENLOCK CONNECTING CABLE KIT. THIS ALLOWS PRO-GEN TO BE USED STRAIGHTAWAY WITH MOST POPULAR VIDEO EQUIPMENT, WITHOUT THE NEED TO HUNT DOWN THE CORRECT CONNECTING CABLES. THIS KIT CAN ALSO BE USED TO CONNECT IN OTHER WAYS... eg. VCR TO VCR etc.
A KIT TO START YOU OFF RIGHT FROM THE MOMENT YOU OPEN THE BOX!!!

NEW LOWER PRICE

PRO-GEN with Photon Paint 2.0 ONLY £99.95

Mode Switch-box for Genlocks

Features Include
- -Compatible With The Pro-Gen And Rendale 8802
- -Supplied With Genlock Extender Cable Worth £9.95
- -Switch-box Switches Between Foreground, Background, Video And Computer Modes.

£29.95

Finance terms are available (subject to status) for most products, please see our ordering panel at the end of this advert for full details

FREE... Fully Tailored Dust Cover with all Dot Matrix Printers

NEW FREE ACCESSORIES

PRINTERS

All printers in our range include a standard Centronics/Parallel Port for direct connection to Amiga, PC's, Atari ST's, Archimedes etc.

We supply a connection cable to YOUR computer FREE
plus a Quality Dust Cover with ALL Dot Matrix Printers FREE



When you are comparing our prices to others make sure that the same essential items are included eg. Printer Lead, Dust Cover, Postage and VAT etc.

GORDON HARWOOD PRINTER STARTER PACK
ALL our Dot Matrix Printers are supplied complete with...
200 Sheets of Continuous Printer Paper FREE
100 Useful Self Adhesive Continuous Labels FREE
Amiga Printer Drivers Disk FREE

CITIZEN 120D+ 9 PIN MONO - Up to 120/25 cps — £149.95
- Very reliable low cost printer with interchangable interfaces for Centronics/RS232/serial type (C64 etc.)
- Full 2 Year manufacturers warranty

NEW FASTER STAR LC20 9 PIN MONO - Up to 150/38 cps — £159.95
Replacement for our most popular Mono Dot-Matrix at a super low price
- Multiple font options easily accessible from front panel
- Excellent paper handling facilities
- Simultaneous, continuous and single sheet stationery
- 240 x 240 dpi Graphics

STAR LC200 9 PIN COLOUR PRINTER - 185/40 cps — £209.95
This is the one in our packs!
- 80 Column Dot Matrix
- 240 dpi - 9 Pin COLOUR
- 16K Buffer, 8 Resident Fonts
- Push/pull tractor & rear/bottom feeds
- Reverse paper feeds
- Micro paper feed, Max. paper width 11.7"
- Supplied with colour & mono ribbons
- Paper park with auto single sheet loading
- Programmable from front panel.
- 12 month warranty

CITIZEN SWIFT 9 PIN COLOUR - 160/40cps — £219.95
New super high spec 9Pin colour printer
- 8K Buffer 4 Fonts
- Push and pull tractor built-in
- Feed for labels/multi part stationery
- 240 x 240 dpi Colour Graphics
- Best text quality in our 9Pin range
- 2 Year Citizen warranty

STAR SJ48 INKJET PRINTER — £249.95
New super high quality bubble ink jet printer
- 64 Nozzle ink jet
- Emulates Epson LQ and IBM Proprinter for full compatibility
- Complete with AC adaptor
- Large 28K Buffer
- 360 x 360 dpi near laser print quality
- Optional Ni-Cad battery for mains free operation

STAR LC24/200 24 PIN MONO - 220/55 cps — £249.95
Mono version of LC24/200 Colour, same spec except for a smaller 7K buffer

STAR LC24/200 24 PIN COLOUR - 220/55 cps — £299.95
Colour version of the LC24-200 Mono.
- 80 Column Dot Matrix
- 360 dpi - 24 Pin MONO
- 30K Buffer (expandable)
- 10 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feed
- Paper park with auto single sheet loading
- Micro paper feed, Max. paper width 11.7"
- Supplied with mono ribbon
- Faster than the old LC24-10
- Extra font cartridges available
- Program from front panel, No DIP switches
- 12 month warranty

NEW 24 Pin CITIZEN 224 COLOUR - 160/53 cps — £259.95
Brand New, lowest cost colour 24 Pin printer, anywhere!
- 80 Column Dot Matrix with 4 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use front panel controls
- Push & pull tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

NEW 24 Pin CITIZEN SWIFT 24E COLOUR - 180/60 cps — £319.95
Brand New, superb specification colour 24 Pin printer.
- 80 Column Dot Matrix with 7 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use LCD panel controls
- Push/pull & bottom tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

NEW FASTER STAR XB 24 PIN COLOUR RANGE XB24-200 & XB24-250 - 275/80 cps — £399.95 24-200 Colour; Wide Carriage £499.95 24-250 Colour
These NEW top of the range Stars replace the XB24/10 & XB24/15, & offer the best possible quality dot matrix printing
- Exceptional print quality
- 4 x 48Pin super letter quality fonts
- 14 x 24Pin near letter quality fonts
- Buffer: 29K(XB24/200) & 76K (XB 24/250)
- 360 x 360 dpi Colour Graphics
- 12mths on-site warranty (UK Mainland)

HEWLETT PACKARD PAINTJET COLOUR A4 INKJET — £599.95
Our best quality full colour printer at a realistic price
- Parallel/Centronics or Serial RS232 I/F (specify with order, MAC option available)
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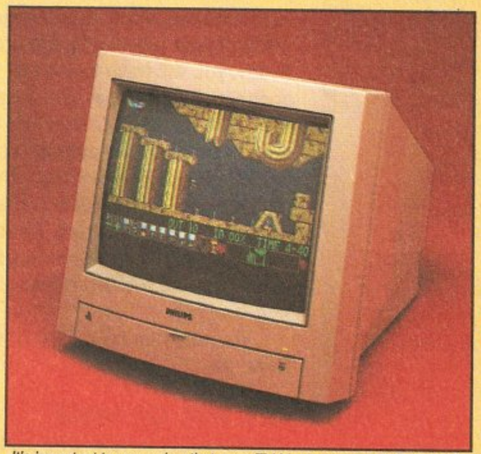
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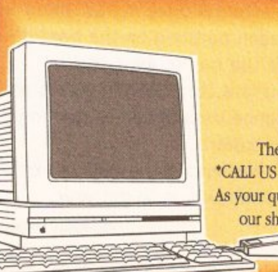
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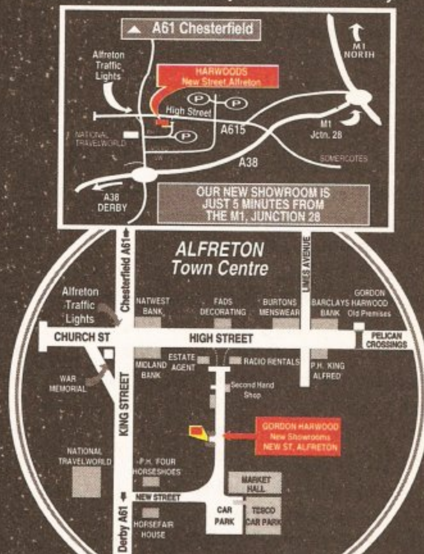
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continued from page 54

ASDG's *Art Department*.

CAD and Structured drawing packages like *X-CAD* and *Professional Draw* don't have this problem as the images that you create are not stored in memory as pixel representations – indeed, the screen is only used to give you a rough idea of the final image. The images themselves are stored in memory as a series of 'vectors' that are really nothing more than a bunch of co-ordinates that tell the computer where each point within the image lies in relation to others. Even when you draw a line using *X-CAD*, the computer only knows about the line's start and end position – it only turns the line into a line when the image data is translated into what you see on screen.

The real advantage of vector-based packages doesn't really become apparent until you print an image out on to a very high resolution output device like an imagesetter. Whereas a pixel-based image would look 'chunky', a vector-based image would be printed at the maximum resolution of your printer, giving lines and curves of incredible smoothness.

You're probably assuming by now that CAD and structured drawing are one in the same, but this isn't entirely correct. The differences between them occur as a direct result of the applications that they are used for. CAD packages are used to produce highly technical diagrams such as the schematics of component and architectural plans. Structured drawing packages, on the other hand, are used for more artistic applications such as DTP where you will want to create images such as company logos etc. So, although both packages use the same theory, the tools that they offer vary according to the application.

b) To date, the only structured drawing package available that directly supports Gold Disk's proprietry 'clip' format is Gold Disk's own *Professional Draw 2.0*. It's a rather expensive package (especially when compared to the price of *PageSetter 2*), but it's well worth the asking price.

DesignWorks is very similar to *Professional Draw* in many respects, but it has one major failing that reduces its worth considerably. Because of reasoning known only to the chaps at New Horizons, *DesignWorks* is totally and utterly incompatible with every DTP program on the market – including *PageSetter 2* – so steer well clear until they come to their senses and release an upgraded version that at least supports EPSF and CLIP format.

c) Put simply, Compugraphic fonts and outline fonts are one and the same. The only difference between them is that Compugraphic fonts are a distinct type of outline font pioneered by the AGFA/Compugraphic Corporation whereas the term 'outline font' is a more general description that can apply to a wide variety of font types on both the Amiga and the PC. In general, although outline fonts work in a very similar way, they are hardly ever compatible with each other (there are even several different types of Compugraphic outline fonts!)

d) As the name suggests, a colour font is a bitmapped font that contains colour – that is, it's not a mono font like the bitmapped fonts supplied on your Workbench disk. Pioneered by Software Toolworks, colourfonts are standard Amiga bitmapped fonts that can contain up to sixteen colours making them ideal for video work. Whilst a standard font can only contain a single colour, the extra colours available with colourfonts have allowed font designers to apply textures to them – wood, marble etc.

Under 1.3, only a few packages actually support colourfonts and even then you have to run a patch program to get them to recognise the fonts correctly. One of the first was *Deluxe Paint 3*, although most new packages also support them. Colourfont support has now been built into 2.0 (so you no longer need to run the patch program), although the package still needs to be specifically designed to handle colourfonts. As far as I'm aware, no DTP programs support colourfonts.

e) This is a problem often encountered with American packages. Although they support PAL resolution screens in normal operation, when you swap to an overscanned display they think you're running on an NTSC machine and shrink the display accordingly. I'm afraid all you can do is to upgrade to the latest release, *Photon Paint 2*. Not only is the PAL overscan problem cured, but you'll get lots of new features which aren't in the earlier version.

The best news of all is the price of *Photon Paint 2* – although MicroIllusions are still selling it at the original price, it is available from several mail order supplies for as little as £25! Shop around and I'm sure you may well be able to buy it at an even cheaper price than this.

f) I can't see you having any problems (Auto-Config is a fairly intelligent beast!), but it's worth checking with the company that you buy the expansion from first before handing over any cash.

g) As you haven't supplied any specific details about the nature of the problem, I can't really say what is causing it. I would guess that you're putting too much strain on the Amiga's power supply. Commodore state that the A500 can only safely power a single external drive and a 512k RAM expansion, so you may have to replace the power supply brick with a beefier unit to cure the problem. I would do this first even if it doesn't cure your crashing problems because you're obviously straining the machine. If this doesn't cure the problem, I'd advise you to take the machine along you to your nearest Amiga repair centre and ask them to check it out for you. ***JH***

JARGON BUSTING • JARGON BUSTING

Addbuffers – An AmigaDOS command which sets aside an area of memory between computer and disk drive, helping to speed up disk accesses.

Bit – A binary digit, with a possible value of zero or one.

Bitplane/bitmap – A bitplane is an area of memory where every binary bit corresponds to a pixel. One bitplane represents a monochrome image, several can be overlayed (a bitmap) to represent a colour image.

NTSC – National Television Standards Committee. This is the name for the TV colour coding system used in the USA and other countries. It has 525 lines, running at 60 fields and 30 frames/second.

Overscan – A way of achieving a resolution higher than the Amiga's standard by utilising the border areas of the screen which are normally left blank.

PAL – Phase Alteration Line, the other main TV coding system. In fact, there are several hybrid PAL systems in use, all of which are slightly different.

MORE CHIP RAM HASSLE

I have a trapdoor 0.5Mb expansion which I assumed when purchasing would be considered as Chip memory. However, when I type AVAIL in the shell, I am told that it is considered as Fast memory. Why is this?.

J Moss
Barrow-in-Furness

The 0.5Mb expansion is only converted to Chip RAM if you do two things: use an Amiga fitted with the Fatter Agnus chip *and* do two small solder-changes to the motherboard to convert the RAM to Chip RAM and force the Amiga to treat it as such.

I assume you have a revision 6a motherboard (which most Amiga 500s of your machine's age are). Firstly, you will have to cut the connection on Jumper J7A (next to the A501 connector). Now find three small square solder pads at J2 (this is just above the ROM chip – the 40-pin chip next to the 68000, the largest chip on the board. Cut the track between the bottom two and, lastly, join the top two together with some solder.

You will then have 1Mb of Chip RAM. ***JR***

OH, PAL OF MINE

I have a 1Mb Amiga 500 (512k Chip memory), with an added drive and a recently acquired GVP Impact 11 hard drive. As a complete novice with hard drives I have sweated blood getting to grips with it, but have now installed some utilities and *Pen Pal*.

I am finding it impossible to use graphics with *Pen Pal* as when I try to load even a small graphic I get a "not enough memory" message, even though the set-up screen may typically show 79k available for pictures and 49k required.

I assume that something is being put into RAM, but it makes no difference if I use *DiskMaster* to delete all the headline fonts and the dictionary. Can you point out where I am going wrong?

On a second query, I have used *Quarterback* to back up the hard drive but would like to put some of my PD games on it, and also commercial games. Can you recommend any software to do this, preferably PD?

MK Corbett
Wellington
Shropshire

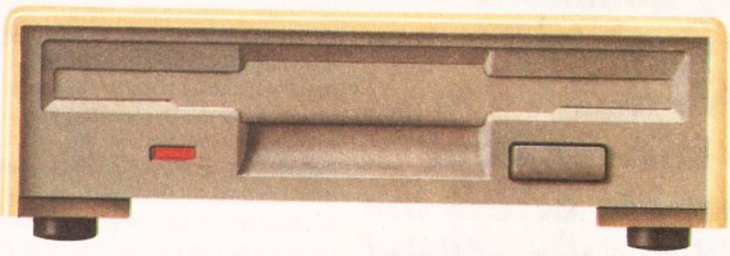
The problem you are having with *Pen Pal* lies in the fact that you have only 512k of graphics (Chip) memory inside your Amiga. Although the *Pen Pal* program will load into expansion (Fast) memory, it will use graphics memory for its colourful display, its menus and requesters, its fonts, and maybe one or two other things.

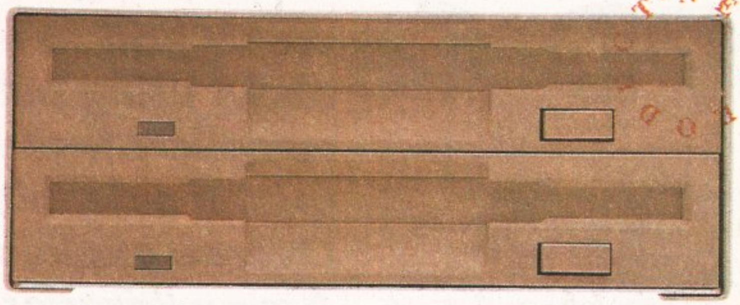
The other part of your system that is using up graphics memory is the external drive and hard drive – each external drive needs about 30k, and each partition on the hard drive needs the same. Also, the Addbuffers command in your startup-sequence uses graphics memory for those buffers.

At the end of the day, the only honest answer is to get your

continued on page 6

Where you can stick it.





Viruses, disk swapping, clicking drives, disks which won't back up. Is there no end to the whingeing of the Amiga user?

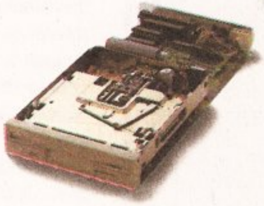
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Compiling the PD Cs

We've had so many questions about using public domain C compilers that we've decided to print the definitive answer. Paul Overaa explains how to access the Amiga libraries without the official files Commodore includes

I own V1.3 of the *NorthC* compiler, and have read all the documents. I've spent many hours pouring over C manuals but nevertheless remain stumped. Because I cannot use some header files which appear in the examples (eg memory.h which is not supplied with *NorthC*) I find it hard to do even simple things such as opening a window.

I notice however that in the lib.c directory a number of library stubs are supposed to be available, in order to call AmigaDOS library functions – but I cannot get anywhere with this and all I get are "lib member not found" messages.

Could you please give me a short example source program which will open a screen and window, plot a line, and then close them again.

Tony Poole
Bristol

Your 'lib member not found' type messages seem to suggest that either you haven't defined the appropriate system structures in the first place or you have not told the compiler the location of the files that hold the definitions (*Amiga Shopper*'s issue 7 had a '*NorthC* Rescue' answer that will help here).

I suspect however that it is confusion about header files that has caused your problems so here are some notes/examples that should help.

The Amiga system header files contain definitions, structure templates, macros etc, designed to simply the task of programming. By including the appropriate headers, these definitions become available to your program. By including the exec/types.h header file, for instance, all of the Amiga data types (BOOL, LONG, ULONG,APTR etc) can be used within your program. Just because you do not have the official header files however *does not* mean that you cannot necessarily use such definitions – but it does mean that you'll have to create suitable definitions by getting hold of the header file listings (available in the *Includes & Autodocs ROM Kernal Manual*) and typing them in yourself. This is not a path I'd recommend. My advice, if you are serious about programming the Amiga, would be for you to get the official header files as soon as possible.

Since limited Intuition experimentation is possible without using the system headers files I think, by explaining in detail how it is done, it'll be possible to go over a lo of things that may be causing you much grief. To start with I've written (using Kernighan and Ritchie C, sinc most PD compilers use this standard) a small program which opens the graphics and Intuition libraries, prints a message to that effect, and closes them again – this is the program shown in Listing 1. In these examples I've used a technique for resource allocation an deallocation based on creating lists of things which need to be opened and closed.

As it stands the program versio will still *not* compile with the *NorthC* package as usually supplied becaus the #include <exec/types.h> reference asks the compiler to include a system header file and of course this isn't provided with *NorthC*. *NorthC* does however provic a types.h file which contains many (the standard Amiga type definitions *but*... it does not include a BOOL type definition and it does not include definitions for TRUE and FALSE (which are present in the exec/types.h system file).

One way of getting Listing 1 to compile under *NorthC* is to add tho extra typedef/#define statements. Listing 2 shows the three new lines that must be added. Alternatively y could add those definitions to *NorthC*'s types.h file, or re-write the program so that it does not use those statements.

One way or the other, then, yo should be able to compile this

LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1

```
/* test1.c */
#include <exec/types.h>
#define INTUITION_VERSION 0
#define GRAPHICS_VERSION 0
#define OPEN_INTUITION_LIBRARY 1
#define OPEN_GRAPHICS_LIBRARY 2
UBYTE g_resource_vector[3] = { 2, /* count of
labels to follow */
   OPEN_INTUITION_LIBRARY,
   OPEN_GRAPHICS_LIBRARY
   };
struct IntuitionBase *IntuitionBase;
struct GfxBase *GfxBase;
main()
{
BOOL begin_block();
void end_block();
if (begin_block()==TRUE) exit(FALSE); /* grab
required resources or quit */
if (GfxBase) printf("graphics library opened
OK\n");
if(IntuitionBase) printf("intuition library
opened OK\n");
end_block(); /* Logical end of program */
}
BOOL begin_block()
{
BOOL allocate_resource();
void deallocate_resource();
UBYTE i, j;
BOOL error_flag=FALSE;
for (i=1;i<=g_resource_vector[0];i++)
   {
error_flag=allocate_resource(g_resource_vecto
r[i]);
   if (error_flag==TRUE)
         { for (j=i-1;j>0;j–
){deallocate_resource(g_resource_vector[j]);}
         i=g_resource_vector[0]+1; /* force
exit from 'i' loop */
         }
   }
return(error_flag);
}
void end_block()
{
void deallocate_resource();
UBYTE i;
for(i=g_resource_vector[0];i>0;i–
){deallocate_resource(g_resource_vector[i]);}
}
BOOL allocate_resource(function_number)
UBYTE function_number;
{
BOOL error_flag=FALSE;
switch (function_number) {
   case OPEN_INTUITION_LIBRARY:
         if(!(IntuitionBase=(struct
IntuitionBase *)
OpenLibrary("intuition.library",INTUITION_VER
SION)))
         {error_flag=TRUE;}
         break;
   case OPEN_GRAPHICS_LIBRARY:
         if(!(GfxBase=(struct GfxBase *)
OpenLibrary("graphics.library",GRAPHICS_VERSI
ON)))
         {error_flag=TRUE;}
         break;
   default: break;
   }
return(error_flag);
}
void deallocate_resource(function_number)
UBYTE function_number;
{
switch (function_number) {
   case OPEN_INTUITION_LIBRARY:
CloseLibrary(IntuitionBase); break;
   case OPEN_GRAPHICS_LIBRARY:
CloseLibrary(GfxBase); break;
   default: break;
   }
}
```

program under *NorthC* without any problems and this should convince you that the Intuition and graphics libraries are openable!

As far as opening screens/windows and using the graphics routines go, I can take you some way down the 'write your own headers' road (despite the fact that I don't recommend this approach). In order to open a screen you need to set up a NewScreen structure. This is normally defined in the screens.h system file but without that header you'll need to create your own template definition. In the program shown in Listing 3 I've added the appropriate structure definitions (typed in from the *RKMs*) and have also made a few alterations in the main code: I've removed the printf() statements, added a RectFill() statement to draw a box on the screen, added a short Delay(), and included fragment for opening and closing an Intuition screen.

To use the RectFill() function it is necessary to obtain the address of the screen's RastPort and this is stored in the Screen structure that Intuition sets up when you do an OpenScreen() call. To use a conventional structure reference (such as global_screen_p->RastPort) I would have needed to type in further system definitions. To avoid this I looked instead in the *Includes and Autodocs ROM Kernal Manual*, saw that in the Screen structure the RastPort field offset is 0x0054, and added this amount to my screen pointer variable. This trick saved a lot of extra typing but be warned – it is not good programming practice.

The final, *NorthC* compilable program opens the graphics and Intuition libraries, opens an Intuition screen, draws a rectangle, waits a bit, and then shuts everything down. In theory at least you can continue in this way adding code for windows, IDCMP communications, menus etc, but as you do so more and more system structure templates and definitions will need to be added to your programs. OK, it doesn't hurt with small programs like the Listing 3 example, but with real Amiga programs the amount of additional typing involved is going to quickly become horrendous! ***PAO***

LISTING 2

```
/* test2.c - additions to
test1.c needed for NorthC
compilation */
#include <types.h>
typedef short BOOL;
#define TRUE 1
#define FALSE 0
/* remaining code as
before */
```

LISTING 3 • LISTING 3 • LISTING 3 • LISTING 3

```
/* test3.c - similar layout to test2.c with
added screen-graphics code */
#include <types.h>
typedef short BOOL;
#define TRUE 1
#define FALSE 0
#define NULL 0
#define INTUITION_VERSION 0
#define GRAPHICS_VERSION 0
#define SCREENPLANES 3
#define SCREENWIDTH 640
#define SCREENHEIGHT 256
/* Some flag definitions that you find in the
system headers... */
#define CUSTOMSCREEN 0x000F
#define HIRES 0x8000
/* NewScreen structure template definition.*/
struct NewScreen
{
   SHORT LeftEdge, TopEdge, Width, Height,
Depth;
   UBYTE DetailPen, BlockPen;
   USHORT ViewModes;
   USHORT Type;
   struct TextAttr *Font;
   UBYTE *DefaultTitle;
   struct Gadget *Gadgets;
   struct BitMap *CustomBitMap;
};
/* Since NewScreen is defined I can create a
real structure instance... */
struct NewScreen NewScreen = {
   0,0, /* top left */
   SCREENWIDTH,SCREENHEIGHT, /* width and
height */
   SCREENPLANES, /* number of bitplanes */
   1,0, /* detail and block pens */
   HIRES, /* ViewModes */
   CUSTOMSCREEN,
   NULL, /* Accept Default Font */
   (UBYTE *)"AMIGA SHOPPER RULES OK!", /* An
excellent Screen Title */
   NULL, /* No Gadgets */
   NULL, /* Let Intuition do bitmap */
};
/* AMIGA RESOURCE "FUNCTION NUMBERS" */
#define OPEN_INTUITION_LIBRARY 1
#define OPEN_GRAPHICS_LIBRARY 2
#define OPEN_CUSTOM_SCREEN 3
UBYTE g_resource_vector[4] = {3, /* count of
labels to follow */
   OPEN_INTUITION_LIBRARY,
   OPEN_GRAPHICS_LIBRARY,
   OPEN_CUSTOM_SCREEN
   };
/* GLOBAL VARIABLES */
struct IntuitionBase *IntuitionBase;
struct GfxBase *GfxBase;
struct Screen *global_screen_p;
ULONG global_rastport;

/* MAIN BLOCK */
main()
{
BOOL begin_block();
void end_block();
if (begin_block()==TRUE) exit(FALSE); /* grab
required resources or quit */
global_rastport=(ULONG)global_screen_p;
global_rastport+=0x0054; /* Yuk, but now it
really points to the RastPort */
RectFill(global_rastport, 200, 100, 250,
150); /* draw an arbitrary box */
Delay(250); /* wait for 5 seconds before
closing down the screen */
end_block(); /* Logical end of program */
}
/* ALLOCATION/DEALLOCATION ROUTINES */
BOOL begin_block()
{
BOOL allocate_resource();
void deallocate_resource();
UBYTE i,j;
BOOL error_flag=FALSE;
for (i=1;i<=g_resource_vector[0];i++)
   {
error_flag=allocate_resource(g_resource_vecto
r[i]);
   if (error_flag==TRUE)
      { for (j=i-1;j>0;j–)
{deallocate_resource(g_resource_vector[j]);}
      i=g_resource_vector[0]+1; /* force
exit from 'i' loop */
      }
   }
return(error_flag);
}
void end_block()
{
void deallocate_resource();
UBYTE i;
for(i=g_resource_vector[0];i>0;i–
){deallocate_resource(g_resource_vector[i]);}
}
BOOL allocate_resource(function_number)
UBYTE function_number;
{
BOOL error_flag=FALSE;
switch (function_number) {
   case OPEN_INTUITION_LIBRARY:
      if(!(IntuitionBase=(struct
IntuitionBase *)
OpenLibrary("intuition.library",INTUITION_VER
SION)))
      {error_flag=TRUE;}
      break;
   case OPEN_GRAPHICS_LIBRARY:
      if(!(GfxBase=(struct GfxBase *)
   OpenLibrary("graphics.library",
GRAPHICS_VERSION)))
      {error_flag=TRUE;}
      break;
   case OPEN_CUSTOM_SCREEN:
      if(!(global_screen_p=(struct Screen
*)OpenScreen(&NewScreen)))
      {error_flag=TRUE;}
      break;
   default: error_flag=TRUE; break;
   }
return(error_flag);
}
void deallocate_resource(function_number)
UBYTE function_number;
{
switch (function_number) {
   case OPEN_INTUITION_LIBRARY:
CloseLibrary(IntuitionBase); break;
   case OPEN_GRAPHICS_LIBRARY:
CloseLibrary(GfxBase); break;
   case OPEN_CUSTOM_SCREEN:
CloseScreen(global_screen_p); break;
   default: break;
   }
}
```

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VISA

Access

continued from page 62

machine upgraded to 1Mb of graphics memory. Depending upon the age of your Amiga, this involves perhaps fitting a new Agnus chip and one or two small changes to the motherboard. Speak to WTS Electronics about this ☎ 0582 491949.

The other option is to sell your old Amiga and buy a new Amiga 500 Plus, which comes with 1Mb of graphics memory as standard, not to mention the new and better version of the operating system.

As for getting your PD games on to your hard drive, it's simply a matter of creating a directory on the hard drive and copying the file or files for that game into that directory. There isn't a program that can do it for you as nobody except the programmer of the game can know which files need to be transferred. If you transfer a game to the hard drive and it won't run, it's probably because there are files on the game disk that it needs that you have neglected to transfer. In this situation your best bet is to contact either the author of the game or the PD library which supplied you with it, and ask them for help.

There are very few commercial games that can be transferred on to hard drive, and those that do will come with programs that will do the job for you. ***JW***

PANASONIC PROBLEM



I have been trying to use the shareware program *PrtDrvGen 2.4* to create a custom driver for my printer (a Panasonic KXP1180). I've had no problem with the standard text part of it, but when it comes to printing graphics, all I get is garbage. I would be grateful for any help you could give me.

I did consider buying the Abacus book *Amiga Printers Inside and Out* but it barely mentions printer drivers and in my opinion it is not worth the paper it is printed on! How about doing an article on printer drivers? What form do these files take and how Preferences and the Amiga system uses them. I'm sure many of your readers would relish such an article!

Artie Ball
Southsea, Hants

The whole point of the PD program you mentioned was to allow users who owned printers that aren't supported by the standard Amiga printer drivers to generate drivers designed specifically for their printers. What I can't understand is your reason for writing a driver for your printer – after all, the Panasonic KXP1180 provides full Epson emulation so you'll be able to use all the facilities that your printer has to offer using the standard EpsonX driver. So why go to the trouble of writing your own driver when the system already provides a suitable driver? Just because it isn't designed specifically for the KXP1180 doesn't mean that it won't work!

The printer drivers article is certainly a good idea and I'm sure Andy, our illustrious editor, will take your idea into consideration. ***JH***

BOBBING ALONG



I wish to enquire about a discrepancy in the Hardware reference manual. It states that there are 313 lines per vblank, each with 113 even cycles, making a total of 35369.

I have recently coded a Bob routine with four Bobs, all in 16 colours, of sizes 85x72, 85x72, 85x72 amd 45x72 and I calculate (with the extra word and restoring of the background, and excluding setup time) it to be using 42624 clocks. This is very close to the maximum possible as it starts to judder with another bob, but this is still well over 7000 clocks over the limit. I am using the interrupt vblank, waiting for line 0. So I am positive that each 50th of a second the aforementioned number can be placed on screen. Also, please could you list the ECS registers and explain their functions and why some cause incompatability?

Ben Cole
Wallington

The discrepancy with your Bob timings is almost certainly due to your code running from Fast memory rather than chip memory. This would explain the fact that you have more processor time available than you would expect for a 16-colour screen. The full list of ECS registers and programming information for the ECS chips can be found in the latest edition of the Hardware Reference manual, published by Addison Wesley (ISBN 0-201-56776-8). ***JR***

MONITOR CONCERNS



Could you please advise me as to which colour monitor would best suit my needs. I am at present using a portable colour television but find it rather a strain on the poor old eyes. I'd ideally like to use all of these in high resolution, but I fear my eyes wouldn't take the strain.

I use my Amiga primarily for *X-CAD Designer*, *Wordworth* and *Deluxe Paint*. I have to run all three in medium resolution simply because the high resolution flicker becomes unbearable. I've seen a number of articles written about flicker fixer cards, but as far as I am aware none of these are available for the A500 (mine as 1Mb of RAM).

I've heard of High Res, VGA, Super VGA screen modes and monitors, but I haven't a clue what to look for. What do you advise?

Because of my strong interest in CAD and computer graphics, I'm thinking about splashing out on a graphics tablet. OK, the mouse does the job well enough, but I feel that a graphics tablet would do the job considerably better. Which one would you recommend?

Finally, where can I get hold of the software which will allow me to transfer *X-CAD* drawings to *AutoCAD* and vice-versa? I understand it is called *DXF* or similar.

Tim Searle
Bristol

The Amiga's interlaced screens are indeed a strain on the eyes if you're only using a colour television, but it is possible to reduce the flicker even on the setup you already own. All you have to do is to set up the screen palette of the applications you are running so that the colours that the program uses aren't so contrasting. I find that using a range of greys can reduce flicker tremendously – especially if the background colour is a set to no more than RGB 777. Try to avoid using white as much as possible; stick to the darker grey shades.

Obviously this isn't always an ideal solution, so a monitor is your best bet. The Commodore 1084S is quite a nice little unit, but it does nothing to reduce interlace flicker (in fact, it's often worse!). Unfortunately, to truly rid yourself of interlacing is not a cheap affair – expect to pay around £500 for the privilege!

I would advise you to splash out on the new enhanced chip set which provides a number of non-interlaced screen modes, but unfortunately not all software supports them (especially older titles). A better bet is to treat yourself to the ICD FlickerFixer card which is available in this country from Silica Systems (☎ 081 309 1111) for about £200. It fits internally inside the A500 and works almost identically to the MicroWay unit you mentioned.

To use the board, you'll also need a multisync monitor. On the whole, multisyncs are still rather expensive, but they can be picked up cheaply if you know where to look. I've seen a number of mail order companies selling suitable multisyncs for as little as £300 so the best thing to do is to scan through the ads in *Amiga Shopper* for the best deal.

I've used a number of graphics tablets myself and I must admit that I've never been that impressed. There's no doubting that they're a more natural way of working, but I still find the mouse to be a far more precise instrument – especially when working in high resolution.

On all the tablets I used, the pointer had an annoying habit of not wanting to stay still, prefering instead to leap around the surrounding pixels as if it were playing hop-scotch. Fact is, tablets aren't the high precision instruments that you may well think they are.

If you really need a touch tablet, then about the best I've seen is the Podscat PT-3030 which is available in this country through those nice people at HB Marketing (☎ 0753 686000).

You may also want to check out Trojan's new lightpen which is available for the measly sum of just £39.95. This gadget enables you to 'draw' directly on to the Amiga monitor, although even this shares the same hop-scotching problem that I mentioned earlier. But, for the price, it's worth checking out.

The program you need to convert *AutoCAD* images to and from *X-CAD*

JARGON BUSTING • JARGON BUSTING

Bob – A blitter object, or software sprite. It is a user-defined graphics object which is placed on and moved around the screen by the part of the Agnus chip known as the blitter.

Graphics tablet – An alternative to the mouse whereby the user moves a pen or stylus across a flat board, and the movements are transmitted to the computer.

Registers – are memory locations internal to a particular chip. They provide means of communicating with the chip and giving it instructions. In the case of the ECS chips, storing numbers in their registers can effect things like the colours on the screen, the resolution, and so on.

VBlank – A vertical blank. A vertical scanning process takes place every 50th of a second, going from the top to the bottom of the display, drawing each line in turn. The point when the scan has passed the bottom of the display is known as the vertical blank, and is the best time to make changes to the display, since no flicker will be apparent.

format is a little add-on for *X-CAD* that will allow you to save images in DXF format (which is the file format used by *AutoCAD*). This should still be available from *X-CAD*'s UK developer CADVision on ☎ 081 603 3313. ***JH***

CHIP RAM MODIFICATION

I tried to make the modification to have 1Mb of Chip RAM on my Amiga 500 with A501 RAM expansion, but it didn't work. I think everything was OK, but when I connected the computer to the mains the power light started blinking (like when a Guru occurs). However, when I put it the right way everything worked fine. What could have happened? Isn't the A501 compatible with this change?

I noticed some (4) unused places for IC's between the RAM chips. I suppose they could be used to increase the computer's memory on board to 1Mb of Chip. If that is possible could you please explain to me how? I have some electronics knowledge and would make the changes myself. What RAM chips would I need? What speed?

N Josl Gil
Portugal

The early A501 used slow 120ns and 150ns chips; some of these cards are too slow to be used as Chip memory with the faster 80ns or less chips in the recent A500s. Buying a new cheaper A501 clone should solve your problem (as long as it is one of the four-chip boards)

You can add extra chips inside the A500 to give 1Mb of Chip RAM, but you can't use this at the same time as an A501 card fitted.

Do the same changes to the board as for the 1Mb Chip RAM modifications and solder four chip holders into the space for the sockets. Solder a decoupling capacitor for each chip (0.1uF should do) in the space below the chip. You will need four 256x4 80ns CMOS DRAMs to place in the sockets.

If you want a clock as well, disable the memory on your A501 (by cutting the EXRAM line as described elsewhere in the answers page this issue), and you will purely have a clock card. This, by the way, is how my A500 is expanded. ***JR***

MATHS PROCESSING

When I purchased an accelerator board from Solid State Leisure I took the opportunity to obtain a maths co-processor (25Mhz 68881) as I like to dabble in ray tracing and fractals.

The problem is how to make sure that programs I write address the 68881. When I telephoned SSL I was advised that the necessary libraries come with the programming language, in my case HiSoft Basic; but when I telephoned HiSoft I was told that the software should come from SSL! I've since been told that the 1.3 maths libraries automatically detect and use co-processors if fitted. Who is correct?

Andrew Roddis
Co. Antrim
N. Ireland

The Amiga system maths libraries were re-written for 1.3 and the good news is that besides the faster software floating point emulation, the new versions do support the 68020/68881 processor/co-processor combination. The result of this should be that the system's use of the 68881 chip is transparent and when programming in a high-level language which either makes use of the system maths libraries (or implements alternative 68020/68881 routines) you shouldn't have to do anything – 68881 use will occur automatically if the processor is present. HiSoft's technical department has in fact confirmed that its Basic does automatically recognise, and use, the maths co-processor if it is fitted.

This transparent detection and use is a great advantage – it means that any piece of software you write will run on either a standard Amiga or one fitted with accelerator/floating-point hardware without you having to create separate versions of your programs. (What in fact happens is that the software-emulation/68881-hardware calculation decision making is done by the library when it is first initialized and from that point on the system uses the fastest resources available for performing subsequent calculations.) ***PAO***

SEQUENCE OF ERRORS

I have the following problem with sequential files in AMOS: I have 10 array variables, each with dimension of 100 (Dim A(100), B(100) etc). I want to save/load the variables in a sequential file using a single For/Next loop. The saving works fine, but I am unable to load the information back in. I can get the program to work fine if each variable has its own corresponding loop; but this is bad programming, wasteful of time and memory. Can you help?

Andrew Evans
New Tredegar
Gwent

This seems to be a bugette in AMOS – one which has caused me headaches in the past. The problem seems to arise when more than one variable is sent to a file with a single Print statement. The commas seem to cause confusion.

The easiest way around it is to use a separate line to output each variable. A simple example looks like this:

```
Dim A(100),B(100),C(100)
For I=1 To 100
A(I)=Rnd(25)
B(I)=Rnd(25)
C(I)=Rnd(25)
Next I
Open Out 1,"file"
For I=1 To 100
Print #1,A(I)
Print #1,B(I)
Print #1,C(I)
Close 1
Open In 1,"file"
For I=1 To 100
Input #1,A(I)
Input #1,B(I)
Input #1,C(I)
Next I
Close 1
```

Although each Print statement needs to be on a separate line, it's not necessary to use a separate For/Next loop for each variable, so it's still reasonably efficient. ***CR***

SPACED OUT AMOS

I have recently been using AMOS 1.2 to write a program for my A-level project which handles football leagues. My teacher said I will need a printout of my program, so I connected my Amiga to the college's Epson printer.

I highlighted my program as a block and used the Print Block command from the Blocks menu. As the printout arrived I was horrified to see that it was printing with triple line spacing. Apart from taking an age to print, it would have used up a mountain of paper and been very difficult to read.

Paul Watson
Nottingham

If you get double line spacing in printouts it's because the Amiga is sending a line feed at the end of every line, and so is the printer. Check to see if there is a DIP switch on your Epson printer which lets you switch the printer's automatic line feed off. If there isn't one, you can suppress the line feed by cutting or disconnecting line 14 in the cable.

But you say you're getting triple line spacing. In theory this would happen if at the end of every line AMOS sent a line feed, the Amiga sent a line feed and the printer sent a line feed. The people I've spoken to say they've not experienced this problem with AMOS listing printouts, but they're all using 1.3, which is what I suggest you do. Contact Europress Software ☎ 0625 859333 for details about upgrading. ***JW***

SWAPPING SCSI DRIVES

Is it possible to take my SCSI 105Mb hard disk mechanism out and swap it with the 52mb hard disk mechanism in the A500 GVP HD8+? Is it just a case of unscrewing them and swapping the mechanism over?

Ben Andrews
High Wycombe

Yes, it is fairly straight forward. Remove the drives from their respective controllers and plug each into the other controller. With both the Fujitsu 105Mb drive and the Quantum 52Mb drive you must make sure that pin 1 on the SCSI cable (with the red edge) is plugged into the side of the SCSI connector nearest the power connector. You may also have to reformat both drives with the software supplied with each controller, so back up the drives first. ***JR***

JARGON BUSTING • JARGON BUSTING

DIP switch – A method employed by several devices, including hard drives and printers, to enable the user to make manual adjustments to the way the device behaves. Printers typically have DIP switches to control line feeds, perforation skips and the kind of fonts they will use.

Guru – A message from the Amiga system saying that a fatal error has occurred. The message appears in a large, flashing red box and includes two numbers which are of use to programmers trying to ascertain why their programs have failed.

Library – A pre-written program already present in the operating system to make use of the Amiga's features.

Maths co-processor – A chip which sits alongside the Amiga's central processor and performs complex mathematical operations as single machine code instructions. This method is much faster than using many more of the central processor's similar instructions to achieve the same effect.

Beginners start here

On the next three pages, deputy editor Cliff Ramshaw answers a number of questions frequently asked by those new to the Amiga

Having taken your brand new Amiga out of its box and plugged it in, you may well be more than a little bewildered at what confronts you. Although the machine is on the whole easy to use, there are a host of concepts to learn before you can make full use of it. Here we aim to outline some of these fundamentals to save you time and effort in coming to grips with your new machine; but always remember that the best way to learn about the Amiga is to experiment.

WHAT IS A COMPUTER?

A computer is a machine which will follow a set of instructions. It cannot think, but merely does what it is told. The instructions which it follows can come from a number of sources: instructions held internally, from the makers of the computer; instructions from a third-party program which is loaded in from a floppy disk; instructions from you, the user, typed in at the keyboard. The results, known collectively as 'output', are sent either to the screen, to the printer (if you have one) or to the disk in the floppy disk drive.

HOW DOES IT WORK?

Well, without getting carried away... at the heart of the machine is something called the Central Processing Unit (CPU). This is the bit which interprets the instructions sent to it (in a very simple language called 'machine code') and does what they tell it to. The instructions are held in the computer's memory.

SO WHAT IS MEMORY?

The classic analogy is that of comparing memory to matchboxes. Imagine an incredibly long row of matchboxes, each numbered and each with something inside it. The contents of a memory location can be found or changed by referring to the number of the relevant matchbox, opening it and taking a look (or putting something else in). In practice, all that these matchboxes contain is numbers, but these numbers can be understood by the computer as words, pictures or sound (or indeed they can be kept as numbers). There are two main types of memory: RAM and ROM. RAM (standing for Random Access Memory) can be altered at any time by the computer. Once the power is switched off, the contents of RAM are 'forgotten'. ROM (Read Only Memory), on the other hand, is never changed, even when the power is switched off. It contains the basics of the operating system – the set of instructions which determine the overall behaviour of the machine at all times.

Memory is measured in units known as bytes. In every byte a number between 0 and 255 can be held. To hold bigger numbers, or more complex items of information, bytes are joined together into larger units. More conveniently, memory is spoken of in terms of kilobytes (K) or Megabytes (Mb). A kilobyte is 1,024 bytes; a megabyte is 1,024 kilobytes or 1,048,576 bytes. The reason that they are not nice round 1,000s and 1,000,000 lies in the organisation of bytes according to the rules of binary arithmetic, but that's not important right now...

WHO IS FAT AGNUS?

Possibly the most common question we get asked here at *Amiga Shopper* is about the Fat Agnus chip. Agnus is one of several custom chips inside the Amiga dedicated to producing graphics and sound. Whereas the Amiga's central processor can access all of the memory in the machine, the Agnus chip is limited to a much smaller portion, known as Chip RAM (since it can be accessed by the custom chips).

It is here that graphics information must be stored. Anything you see on the screen has an equivalent form inside the Amiga's memory, in Chip RAM, and it is Agnus (amongst others) that does the job of converting this information into the form of a picture.

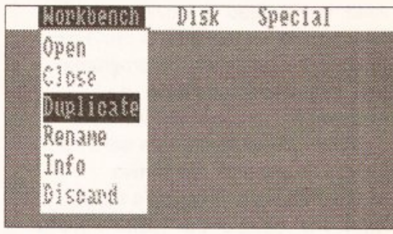
The rest of the Amiga's RAM (as opposed to ROM) is termed Fast RAM. Whenever Agnus accesses the Chip RAM, it prevents the Amiga's central processor from doing so at the same time. Because much of what a processor does involves accessing memory, this has a tendency to slow the processor down. Memory which is not Chip RAM, on the other hand, can be accessed by the processor whenever it likes, without a speed penalty. And that's why it's called Fast RAM.

Now, the more Chip RAM, the better, since it means that more complex graphics can be on screen at once, bigger and smoother animations can be performed and more impressive sound samples used. The early Agnus chips could access 512K of Chip RAM, or half of a megabyte (the amount of memory that comes with an Amiga 500). This chip is numbered 8361, and was present on A1000s and early A2000 machines.

After that came the Fat Agnus, with a shape more like that of a square and a couple of extra features. This is the one in the majority of Amigas. Its part number is 8371 (or 8370 for the American version). Like its predecessor, it can access 0.5Mb of Chip RAM.

In the last year or so, Amigas have been released with an even newer Agnus chip. This is known as the Fatter Agnus, and it can recognise 1Mb of Chip RAM. It has part number 8372a. An even newer version exists, accessing 2Mb of Chip RAM, but this is only available for the Amiga 3000 and A500 Plus.

Hope that's cleared things up.



A close-up of the Workbench menu; and someone's about to try duplicating a disk

WHAT ABOUT DISKS?

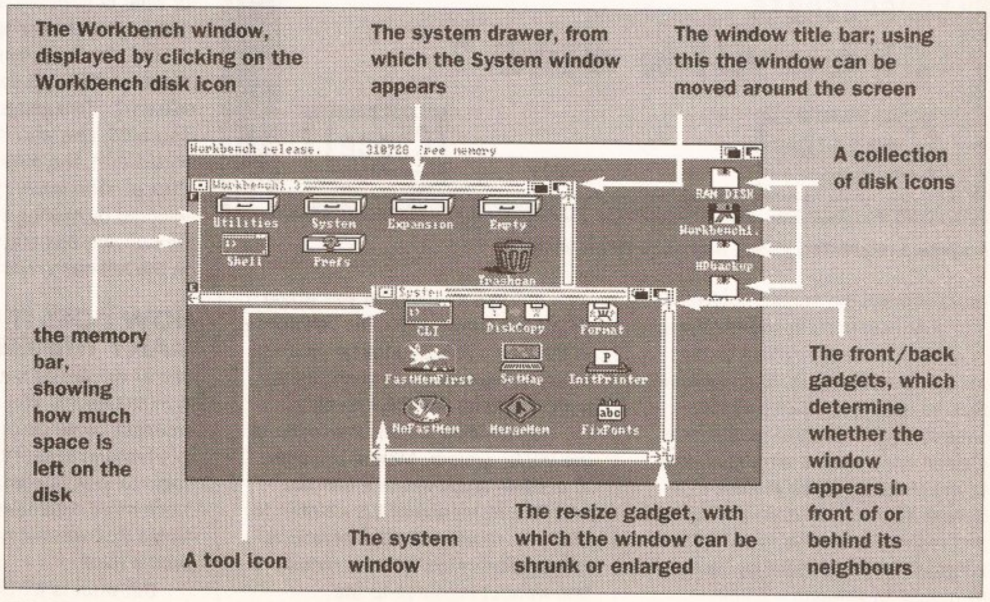
Disks can be thought of as removable memory. The difference is that the processor cannot directly access anything held on a disk. Before it can get its hands on it, the contents of the disk must be 'loaded' into the computer's RAM.

Information is stored on a disk in the form of files. A file is simply a grouping of related infomation with a name. The information is referenced by using the file name.

WHAT KIND OF INFO?

Two types of information may be held in memory and on disks. The first type is the information which makes up a program. A program is a collection of instructions for the computer to follow. As well as the operating system, which is nearly always present, the Amiga may have several programs 'running' inside its

continued on page 70



This illustration shows the basic components of the Amiga's Workbench screen

continued from page 69

memory at any one time. These can instruct it do such things as draw pictures or operate a spreadsheet.

The second type of information is known as 'data'. This is also held in RAM, but instead of providing instructions for the CPU, it provides information on which the programs may operate. For instance, a program which adds two numbers together needs some data before it can be of any use. These two numbers are the program's input data. The result of the addition is the output data. Another example is given by the *Deluxe Paint* package. This is a program. Any key presses or mouse movements you make are input data for the program; the picture that is gradually drawn is the output data. Of course, this picture may be saved on to a disk at any time, and loaded back at a future date. In such a case, the picture has now become input data for the program. As you can see, the distinction between input and output data can become somewhat blurred.

WHO'S A WIMP?

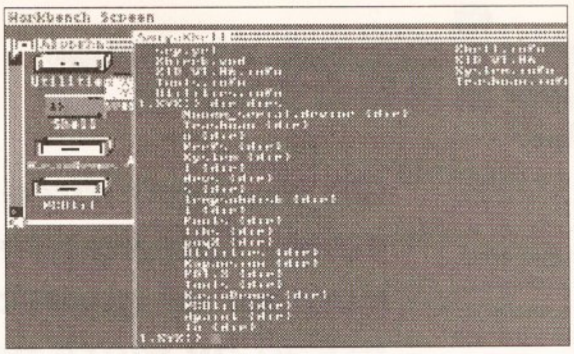
In days of yore, people used to control computers exclusively by keyboards. Because of the relatively new WIMP (windows, icons, menus, pointer) system, many tasks can be greatly speeded up and performed in a more intuitive manner (hence the name of the part of the Amiga's operating system that deals with this: Intuition).

All disks, programs and related collections of data are displayed on the screen as small pictures, known as icons. To prevent things getting too cluttered, the screen is divided into small sections called windows, in which the icons relevant to that window are displayed. Each window may be open or closed (in which case it reverts to either a disk or a drawer icon), moved around relative to the screen, moved in front of or behind other windows on the screen, and resized to display more or less information. All of this may be done by means of gadgets – small graphical symbols around each window's borders that represent these functions. Windows may be nested hierarchically inside each other by means of drawer icons. Whenever a drawer icon is opened, a new window is drawn with its own icons within it.

Icons are accessed with the screen pointer, which is moved across the screen by moving the mouse across the desk. Once the pointer is above an icon, that icon can be accessed by pressing the left mouse button twice in quick succession (a process termed 'double-clicking'). The effects of this will vary depending on the icon in question: in the case of a disk or drawer icon, a window will be opened; in the case of a program (or 'tool'), the program will be loaded from disk into RAM and run (in other words, the Amiga will start to follow the instructions contained in the program); clicking on a data icon (or 'project') will result in the data's corresponding program or tool being loaded from disk along with the data on which it will begin to operate. The pointer is also used to control a window's gadgets, but in this case the left mouse button need only be pressed once.

A special type of icon that you should be aware of is the 'trashcan' icon. Other icons may be moved inside here by placing the pointer above them, pressing and keeping pressed the left-hand mouse button, and moving the pointer and icon until they are above the trashcan. Releasing the mouse button results in the icon being dumped in the trashcan. The contents of the trashcan can be revealed by clicking on it in the same way as you would click on a drawer icon. The difference is that the trashcan may be emptied, in which case all of its contents are gone for good. Handle with care.

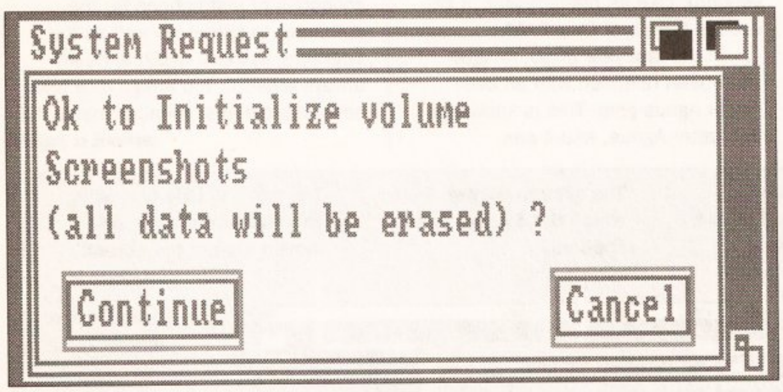
Menus are another innovation of the WIMP system. Menus are a list of options displayed in a text box, selected by means of the pointer. In this way, more complex operations can be performed with the mouse and without recourse to the keyboard. When first switched on and with Workbench loaded in RAM (Workbench is the part of the Amiga's operating system which is not held permanently in ROM), a basic set of menus are available which enable you to do such useful things as copy disks and so forth. Most programs have their own custom set of menus, relating to the particular things that the program is used for.



The Shell provides a command-line interface to the Amiga, similar to that used on IBM PC-compatibles

Menus are displayed at the top of the screen. Pressing the right-hand mouse button (and keeping it pressed) reveals the title of each available menu in the white bar at the top. Moving the pointer up to one of these titles (with the mouse button still pressed) will cause the Amiga to display the list of options in a box beneath the title. As the pointer is moved down this box, each of the options will be highlighted in turn. Releasing the right-hand mouse button with one of the options highlighted will result in that option being executed.

Although not mentioned in the WIMP acronym, another aspect of the system is the 'requester'. A requester is a box that appears on the screen during an operation – usually a dangerous one such as erasing a disk – displaying a small amount of text and asking the user for what is normally a yes or no reply. In the case of erasing a disk, the text will say 'Ok to initialise volume [name of disk] (all data will be erased)?'. Two gadgets are displayed, one with 'Continue' written in it, the other displaying 'Cancel'. The option you want is selected by moving the pointer over the relevant box and pressing once on the left-hand mouse button.



A system requester, giving a chance to reconsider

HOW DOES IT DO SO MANY THINGS AT ONCE?

One of the Amiga's special features is multi-tasking. The Amiga is unique amongst home computers in having this feature; in fact it's not until you begin to look at computers very much more expensive than the Amiga that you will normally find such a thing.

But what is it? Basically, multi-tasking is the ability to run more than one program at the same time. This may not seem like a big deal: after all, there is only one of you controlling the thing, and you can't control more than one program at a time. There are advantages to multi-tasking, though.

At its simplest, multi-tasking allows several programs to be running in memory, waiting for you, the user, to use them. You can be working on one of these programs, a word processor for instance, and suddenly realise that you need to do some mathematics so that you can put the answers to some calculations in your document. Ordinarily, you would have to quit out of the word processor, load up the calculator program (OK, I'm assuming you don't have a pocket calculator, but you get the idea), do your sums and write down the answers, then quit out of the calculator and load your word processor again, load in your document, find where you were in it and type in the answers from your piece of paper. Quite a hassle. With the Amiga, the calculator could have been waiting in the background all along, eager to help you out. A couple of mouse clicks brings it into action, and you can get your results there and then. Again, a couple of mouse clicks brings back the word processor, exactly where you left it. With more sophisticated software, you will often find that the data can be directly transferred from one program to another, saving you even more work.

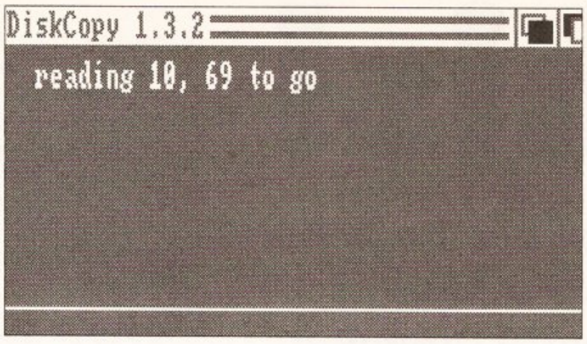
Another advantage of multi-tasking is in running programs which require little or no user input. For instance, you could set a landscape generator going, and meanwhile get on with adding up your family accounts or whatever.

Theoretically, there is no limit to the number of programs you can have running at once. In practice, the number is limited by your available memory: each program requires its share. Also, the more programs that are running, the slower the machine becomes overall. This is because of the way multi-tasking works.

The central processor of a machine like the Amiga can only do one thing at a time. A part of the Amiga's operating system known as Exec (for Executive) decides what the processor will do next. It looks at all of the programs running, and gives each of them in turn a little slice of the processor's time. This swapping from one program to another

happens so fast that all of the programs seems to be running at once. It's all very clever, especially when you consider that Exec itself is just one amongst the many programs running in this way.

To be fair, there are a couple of disadvantages to multi-tasking. The first is that it is often unnecessary. It *can* be useful, but ore often than not you will want to use your computer for one job at a time. But because multi-tasking is such a complex business, it means that the Amiga's operating system is much bigger and complex than it might otherwise be. And this means that it is more likely to fall over occasionally, which leads us on to the second disadvantage: crashing. On mini and mainframe computers, which as well as being multi-tasking also support several users, each program is well protected from all of the others running at the same time. That way, if one program crashes, the rest can go on unharmed. With the Amiga, though, this is not the case. It is possible for a rogue program to effect any others that may be present. In general, if one program crashes on the Amiga, they all crash and the machine has to be re-booted. If you've been entering your accounts for the last hour and a half when your Mandelbrot program decides to crash, all of your typing will be lost. This is one good argument for saving your work to disk at regular intervals.



The display when duplicating a disk. A disk is divided up into 80 cylinders, most of which have yet to be copied

HOW DO I COPY DISKS?

The first thing that you should do after unpacking your new Amiga is to make copies of your Workbench and Extras disks. This advice also applies to any other disks that you get – although most games and some serious software won't allow you to do this in the interests of preventing piracy.

Copying disks is a good idea because disks have a tendency to get corrupted and lose whatever is stored on them from time to time. Always use the backup copies that you have made, and store the originals in a safe place against the eventuality that your backups fail.

Copying disks on the Amiga is easy, although if you only have one disk drive it can take a little bit of time. In the following description, I'll assume that you only have one floppy disk drive.

First, boot the machine up as normal (this simply means 'switch it on and put in the Workbench disk when you are told to do so'). Then insert the disk that you want to copy. Move the pointer over the disk's icon, and click on it once with the left-hand mouse button. The icon should change colour. Now, using the right-hand mouse button, go to the Workbench menu at the top of the screen and select the Duplicate option. A requester will appear asking you to replace the Workbench disk. Do this. There is no need to click on the 'Retry' box (although you can if you really want): the Amiga will realise when you have inserted the correct disk.

You will then be asked to insert the disk that you want to copy. Having done this, you will be asked to insert the 'SOURCE' disk. Actually, this is exactly the same as the disk that you want to copy. If you are sure you have inserted the right one, click on the Continue gadget in the requester with the left-hand mouse button. The Amiga will start reading the information from the disk, keeping you informed as to how much of the reading it has done and how far it still has to go.

After a time, you will be asked to insert the 'TO' disk. Insert a spare disk, but be sure that there is nothing on it which you want to keep, since all of its original contents will be lost. Once this disk is inserted, click on the Continue gadget. The Amiga will start writing the new information to the disk.

Once this is done, you will be asked to insert the SOURCE disk again. This process of swapping disks will continue until the whole of the original disk has been read and susbequently written to the new disk. After this, the new disk will be named as 'copy of [name of original]'.

It is usually a good idea to rename the disk as something more sensible. To do this, select the disk by clicking once on its icon with the left-hand mouse button, then go to the Workbench menu and select the Rename option. Delete the text of the old name in the box provided, and then type in the name by which you want to refer to the disk. When you are done, press the [Return] key and the whole process is finished.

WHAT USE IS THE SHELL?

Although most things that would ordinarily require a keyboard can be done on the Amiga using the mouse and WIMP system, there are nevertheless hidden depths which can only be accessed by means of good old typing. These functions are performed by using the Shell, which has an icon that looks like a miniature window.

Older versions of Workbench (version 1.2 and below) don't have a Shell. Instead, they have a CLI (standing for Command Line Interface), which works in pretty much the same way but lacks some of the Shell's more advanced features and is therefore a bit more awkward to use. The CLI's icon looks just like that of the Shell, and may be found in the System drawer of the Workbench disk. If it is not visible, the Preferences icon must be clicked on (inside the Preferences drawer). Once loaded, Preferences will display a screen-full of options, one of which will refer to the CLI. Click on this, and next time you look in the System drawer the CLI will be there, ready and waiting.

Clicking twice on the Shell or CLI icon will open a text window on the screen. It is generally a good idea to enlarge this window so that it takes up all of the screen, since a lot of text can be generated when you are working here.

A full description of what can be done in the Shell is really beyond the scope of this section, but we'll give you a quick taster. One of the most used commands is the 'directory' command, which gives a list of files (programs and collections of data) on a disk. When the Shell opens, you are presented with a 'prompt' inside the window. At this prompt, type the word 'dir' and press the [Return] key.

The disk will whirr, and you will be given a list of all of the files on the disk. You may be surprised to find that there are a lot more files than there are icons when viewed from an ordinary window. For a file to be shown as an icon, it must have a corresponding file with the same name but followed by the characters '.info'. This second file contains information about the icon, such as what it looks like, what kind of file it represents, and where on the screen it should be displayed.

Some filenames have the characters '(dir)' after them. This is not part of the name, but an explanation that the file in question is not a file at all but a directory. A directory is exactly the same as a Workbench drawer. Things are held within it. For example, on the Workbench disk there is a directory called 'c' (standing for 'commands'). This is not visible except from the Shell, because there is no corresponding 'c.info' file and therefore no icon. To find out what is in this directory, type 'dir c' and press [Return]. What is displayed is a list of files. In this case, each of them is a program which you can run by typing its name in at the Shell prompt. If you look closely, you will find a command called 'dir', which is the one you have been using to look at the Workbench disk's contents. For more information about the Shell, check out Mark Smiddy's monthly AmigaDOS column. AS

IN NEXT MONTH'S ISSUE...

Every month in *Amiga Shopper* we print 16 pages of Amiga Answers – answers for everyone from beginners to experts. If you have a question, fill in the form on page 42 and pop it in the post to us.

Amongst the questions we intend to answer in next month's issue are the following:

- **"How can I get an SVGA graphics card to work with my XT Bridgeboard?"**
- **"I am thinking of putting together a customised version of Workbench but I need a few points clearing up. Can you help?"**
- **"Is it possible to convert the Amiga 500 to IBM PC compatibility. Will it make any difference to the performance?"**
- **"If I put an AMOS program in my startup-sequence and another program after it, I find that they jerk badly. Any ideas? Also, how do I make cycle bars with all of the colours available?"**
- **"Would I be able to take the SIMMs from my Cortex expansion and use them in a hard disk such as the GVP Impact II+?"**
- **"What is the difference between standard, multisync and autoscan monitors?"**
- **"I have fitted a fatter Agnus chip to my machine but now it always starts up in NTSC instead of PAL mode, which means that I cannot access the whole of my previously created PAL pictures. What have I done wrong?"**

Grab This!

The second part of our beginners' guide to DTV takes a look at grabbing some more attention



"If you're into video then this column's the one to keep you up with all the latest tips, accessories and gadgets."

Gary Whiteley

If you're all fingers and thumbs at art, one technique which can be immensely useful to DTV-ers is digitising (which isn't Latin for getting your fingers in a twist). Imagine the scene, you can't draw to save your life, but you need a simple animation of a cat to go on a title screen for an advert you are creating for the local vet. Since you can't draw the cat, you have to find some other way of getting it on to the computer.

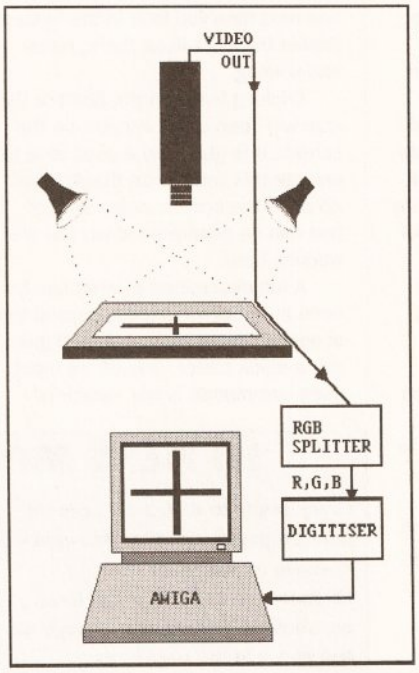
GETTING FRAMED

Well, you could always pay someone else to do the animation for you, but you've got a photograph you would rather like to use as a starting point instead. If you didn't need to combine the image into an animation you could just use a genlock and superimpose the text over a video shot of the photo. But for now the only serious option is digitising. In your case it's from a photograph, but a picture could also be captured from video tape or scanned in from a piece of artwork. With some judicious cleaning up and colour changing you could end up with just the image for the job. Of course, you could always buy some library art, but it's more likely you'll want to do it yourself. But where do you start?

First, you'll need to get hold of the necessary equipment – a video digitiser or perhaps a flatbed scanner, depending on your needs. If you already have a video camera (which is likely if you are involved with video!) then video digitising would be the obvious way to go. But if you plan on regularly inputting a lot of artwork or photographs you may be better off considering a scanner – although it would be possible to get images scanned by a bureau if necessary.

On the video digitiser side there is now a range of devices from relatively low-cost sources such as Rombo's Vidi-Amiga and NewTek's Digi-View, through to real-time devices which can grab images direct from moving video. The latter can get rather pricey, depending on the resolution of the images they can grab. Examples would be Progressive Peripheral's FrameGrabber and ColorPic or SuperPic from JCL, and suitably-equipped 24-bit framebuffers such as ACS's Harlequin, G2's Imagic, NewTek's Video Toaster and GVP's Impact Vision 24.

If you choose to use a video camera you will also need some additional kit – lights and a tripod or copy stand, for instance. But you needn't go to massive expense – a tripod will often do just as well as a copy stand, and at least it has other uses. Regarding lights, even in this country there is a source of free lighting which is often ideal for digitising. It's called the sun – though it seems to be in short supply at the moment, so rather than spend ages hanging about for that gap in the clouds, or just daylight, for that matter, you will find that you will need some alternative light source. Common domestic light bulbs (eg 60 watt pearls) aren't particularly good as they don't give even illumination, but they can produce usable results if you don't mind doing some retouching. But they will often suffice as an extra boost to fill-light those dreary corners the sun cannot reach – so get those Anglepoise lamps out. Fluorescent lighting works best, whether in strips or in rings, as it can be arranged to give the overall flat lighting cover required for good digitising.



A typical colour video camera digitising set up. A VCR could be substituted for the camera if it has a rock-solid pause. A black and white camera will require colour filters



An image created with an inexpensive black and white camera and Digi-View Gold.

Anglepoise lamps are an effective replacement for when the sun is in short supply. Easily rotated, they can be adjusted to fit in with your set up

COLOUR CONFIDENCE

If you want to digitise in colour then you'll need a colour splitter. These come in two basic forms, depending on the video source you are using. If you use a black and white video camera then you should use the coloured gels (one each for the red, green and blue parts of a colour video picture) which are provided with digitisers such as Digi-View. If you have a colour camera or VCR which has no separated RGB outputs then you'll need an electronic splitter.

The reasoning behind splitting is that three separate 'component' images are made, one each for R, G and B, which are then combined together to make a colour picture – rather like the process used in colour printing, though in this case it is light which is being mixed together rather than coloured pigments. In the case of electronic splitters the video signal (which contains the RGB elements mixed together) is electronically 'colour-filtered' to separate the RGB. If you have a Hi-8 or S-VHS camera make sure the splitter can accept their Y/C output, as the image quality should then be much improved over the standard video signal. With a black and white camera the colour filters themselves do the splitting. In each case though, the information required to 'digitise' (ie convert to digital, computer-style data) each colour element of the picture is supplied to the digitiser before being recombined and displayed as the finished image.

A note on cameras – as a general rule the quality of the picture from a camera increases in proportion to the price of the camera, but today's modern technology results in excellent pictures from cameras which cost relatively little compared to the heavyweights of broadcast. But if you have to use a camera which leaves a little to be desired don't forget to use adequate lighting and check the focussing carefully – this will usually help enormously.

HOLD IT RIGHT THERE

Still with me after all that? Right then, back to our cat. Let's assume you've given up trying to get your moggy to sit still long enough to be frozen for posterity and have instead

COPYRIGHT

Generally speaking, if you do not own the image (ie the video or printed picture you wish to digitise from wasn't made by you), or it is not explicitly in the public domain, then you should seek permission from its owners to use it for your work. It should be possible to find out some more details on Copyright Law in your local library.

found a photograph which satisfies your design criteria. Set it under your camera, get the focussing and framing to your liking (and don't forget to white balance, if your camera allows it).

Make sure that the subject is well lit and there are no 'hot spots'. If you are using Digi-View you will have to either use the viewfinder of your camera to check alignment or, if this is not possible, you can either switch between a composite out connected to your Amiga monitor (though you'll have to remove the SCART connection while you do this or the picture will be unsynchronised and wobble like crazy) or somehow pass the camera signal through another monitor so you can see what is going on. One way to do this might be to connect the video out from the camera to the video in of a VCR, take the video out to Digi-View (or the RGB splitter if you have one) and then take the RF (aerial) output to a normal TV.

FLASH, BANG, WALLOP

When all is set, start digitising. Now, you'll have to make a choice about the resolution you'll need for your work – setting it now makes more sense than converting later. If you require the image to be artwork for video then you will require at least a 32 colour interlace, but the choice, as always, is yours and ultimately depends upon your Amiga's memory. Generally I like to work in 16 colour Hi-Res. Set the resolution and start the scan. When it is finished make sure that everything is how you want it to be. You may find that the colour is not to your liking – this is often caused by lighting which has a blue or yellow cast, rather than natural tones. You can generally make adjustments for this, and other parameters, in the digitisers' software or by hardware controls. So make some adjustments and repeat the procedure again until you are happy. If you are just starting out in digitising you'll find it may take a while to get all the various elements of the process under control – if in doubt read the manual, as it will often contain useful tips.

WHAT A PICTURE!

Finally you've grabbed the picture you wanted. Now what? Perhaps you need to tidy up some rough edges, or remove parts of the image you don't require. Get out your paint program, because the real fun can often start here. Cut and paste as you like – photomontage by Amiga! But whether you want images for serious applications like video or DTP, or just want to try out new ways of making graphics, digitising can open lots of new doors to your art.

Elan Performer 2.0

– A Bit of a Media Station!

If you're a regular *Amiga Shopper* reader you'll probably recall my rather mixed review of the *InvisionPlus* combo in *AS* 8. And if you do, you may also remember that I described the Invision software as being a relative of *Elan Performer*.

A rather grown-up relative actually. But for those of us nearer the ground NewTek – who is now handling Elan Design products – has recently released *Elan Performer 2.0* as part of the NewTek MediaStation bundle (which also includes Digi-View *Gold* and *Digi-Paint 3*), though I believe it should also be available separately.

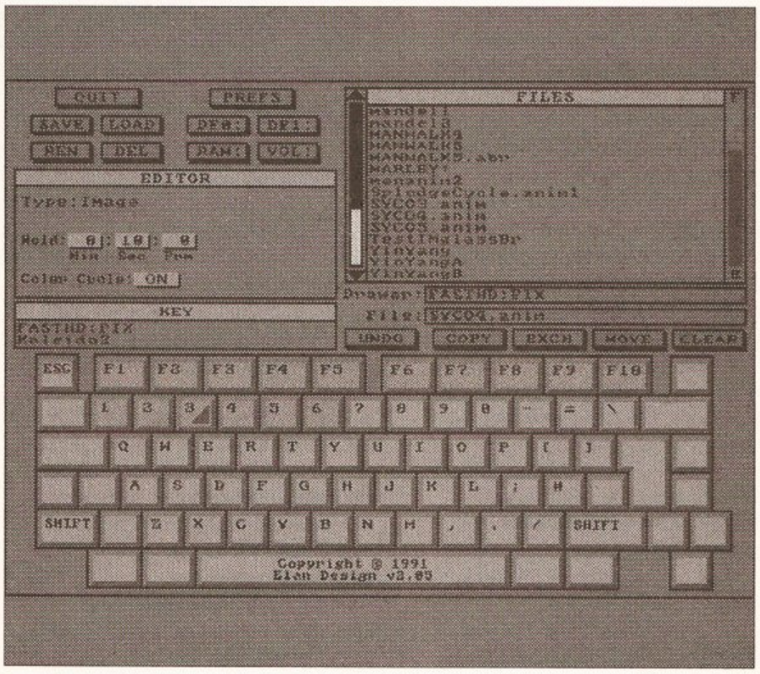
As most people will have read a review of *Digi-View* or *Digi-Paint* already (and more than likely own at least one of these products) I'm just going to concentrate on *Elan Performer 2.0*.

Now, let's be straight right from the start: *Elan Performer 2.0* is *not* a stand-alone equivalent of the Invision program. There are no effects, no wipes, no transitions or other fancy stuff. Nor are there any facilities for adding text.

Fine. Now we know what it isn't. But how about what it is? Simply this – an easy-to-use presentation system which can be used to rapidly put together and display a sequence of pictures and animations. Like a super slide show for the Amiga.

POWERFUL POTENTIAL

So what kind of uses would *Elan Performer 2.0* have? How about a run through of a batch of the best pictures you've done over the last year on your Amiga? It's more than likely that you've produced them in varying resolutions and with vastly different colour palettes, leaving you with no chance of using a program like *Deluxe Paint III* or *IV* to combine them into a single animation, even assuming you have enough memory to display such a file. This is where *Elan Performer 2.0* could come in.



Elan Performer 2.0's a simple to use presentation sytem. It's an effective way of getting together a presentation which is sure to impress your workmates

Tell *Elan Performer* where to find the image you require by double clicking on the name from the requester list, then assign the image to any of the keys represented on the screen. If you build up a sequence like this, you can fire it off straight away or, if you are more fussy, do some fine tuning before unleashing your creation on the gathered hordes.

Elan Performer 2.0 will work with all Amigas but, as is so often the case nowadays, the more memory you have on board, the better it will perform. The same goes for the addition of a hard drive as you will get much faster access to data stored on hard disk than you will from floppies. But even if you don't have any of these extras you will still be able to use *Elan Performer 2.0* to the best ability of your Amiga set-up, although you will be restricted by the amount of free memory your machine has. For instance, with 1Mb of Chip RAM only (ie no additional RAM) in my Amiga I would be unable to load any single image or animation which took the total memory usage over 1Mb.

I said *Elan Performer 2.0* was easy to use, but it isn't as featureless as this description would suggest. For instance, there are adjustments which can be made

continued on page 74

JARGON BUSTING • JARGON BUSTING

Anim – A method of storing animation frames, whereby only the changes between successive frames are stored, thus saving large amounts of space.

Transitions – Are used to change from one image to another by employing such effects as wipes, fades, cuts, teletypes and so on. In video, transitions are normally carried out using a vision mixer or a Special Effects Generator.

Wipe – Describes a visual transition between two images, where the edge of one progressively obscures or reveals the other.

RGB – Red, Green and Blue. The three component cplour images which, when combined together, produce a full colour picture.

continued from page 73

for each loaded image to determine the length of time it remains on screen (in minutes, seconds and frames).

Animations can be looped a chosen number of times, or played in reverse. And you have choices about the overall control of the presentation – from fully automatic playback to manual mouse control. Or simply by pressing a pre-loaded key you can call up any picture available from the current environment. Presentations can even be adjusted on the fly, with timing alterations being entered directly from the keyboard for the on-screen image.

Elan Performer 2.0 can handle many different file types including all the current Amiga IFF picture formats, RIFF, ANIM3 and ANIM5 animation files, *Sculpt4D* Movie files, Impulse RGB8 and RGBN files and NewTek's 21-bit RGB files. Images which don't normally display directly on an Amiga screen (such as IFF24) are converted before display, which could initially take a moment or two. But you could save the images to disk directly from *Elan Performer 2.0* if you wanted to store them for later use (with faster loading). So mark another product up that will also convert a variety of formats to standard old IFF HAM files.

And you're not limited to just being able to load single images or animations into keyboard locations!

If you run out of space you could always load an environment into a single key (by 'attaching' it); this will play back everything it contains when triggered. Such 'nested' keys could be used for cataloguing information, for instance, where an hierarchical search pattern would be used to provide access to increasingly detailed information.

You can even build up animations into a single key location by appending images or ANIMs to the current key. You could then save the resulting animation as a RIFF or ANIM file.

Making changes to the position of an image or animation in the performance is easy – select the key which holds the chosen image, click Move, then click on the new key you wish to move the image to. Voila! Files can be cleared in a similar way.

When you think you've shaped the presentation to your requirements you can store the 'Environment' on disk, thus preserving all the timings and sequencing of your work.

Outside the main program there are also some added tools for interactively choreographing your presentation or manipulating animation files. Of these, the MIDI and Recorder utilities need ARexx to run, which you will have to purchase separately if you wish to use them. Workbench 2.0 users are, however, provided with ARexx as part of their system software.

Within the Tools drawer are utilities for manipulating animation files. For instance the Anim Splicer tool will construct an animation from separate pictures (in either ANIM3, ANIM5 or RIFF format. Conversely, if you have an existing animation which you need to split into its component frames, there's a tool called Anim Cutter to do just this. Handy if you're one of the few people who haven't got *Deluxe Paint* III or IV yet or the animation is in a RIFF format.

With the Recorder utility a prepared environment can be loaded, then altered as it plays back, facilitating the tailoring of a presentation to your required timing and order. Of course, you could do all this by numbers in the main program – it's just more interactively done here, which some users may prefer.

Finally there's MIDI – a utility to allow you to control the presentation from a MIDI keyboard or sequencer if you so wish. By pressing a key on the keyboard (connected by MIDI interfacing to the Amiga, of course) the picture corresponding to that key will be displayed. There is a slight delay between key press and action, but this could be easily compensated for. Additionally, there are settings for the MIDI channel/s that the MIDI program will receive from and for offsetting the MIDI note information so that your keyboard corresponds with *Elan Performer 2.0*'s key layout. It certainly works, and I can see a lot of potential for it if the user has the right MIDI equipment. For example, by using one MIDI channel exclusively for 'picture information' messages, *Elan Performer 2.0* could display images synchronised to a MIDI sequencer playing music back. The only drawback I found here was that I couldn't exit MIDI without a visit from the GURU. But I couldn't pinpoint the fault, so it might be something in my MIDI set-up, rather than a bug in *Elan Performer 2.0*.

THE OVERALL RESULTS

I found *Elan Performer 2.0* a breeze for slapping strings of single images together.

There are none of the common problems with transitions, such as colour palette or resolution changes, because there are no transitions – the pictures simply cut from one to the next. Sure, there is an occasional hiccup if *Elan Performer 2.0* needs to load an image, but if you have enough memory on board to hold the whole presentation then replay will be almost instant after the initial load has finished.

Animations were a little more problematical. I sometimes found that I had a two frame jump back to the start of the currently-displayed anim before the next image was displayed, irrespective of whether *Elan Performer 2.0* had it ready or not. Obviously something to do with the two extra frames required by looping animations, but what?

I reckon that *Elan Performer 2.0* is a lot more useful than I would have initially believed, had I just read the adverts. Obviously there's a world of difference between it and, say, Scala, but there's room for both in the presentation armoury of the serious Amiga graphics producer.

Hmm. Now, what else could I use *Elan Performer* for? How about a front of store presentation, or an interactive information base, or a simple alphabet/keyboard learning tool for youngsters, or... or....

Gary Whiteley is available as drgaz@CIX.Compulink.Co.UK

WHAT ARE ANIMATION FILES?

The ANIM format was developed by Spartafilm as a method of storing computer animation frames, whereby only the changes between successive frames are stored, thus saving significant amounts of space.

There are now several forms of animation files in use on the Amiga, each of which work in slightly different ways. For example, the ANIM3, ANIM5, RIFF, Sculpt Movie and Impulse formats spring to mind. RIFF files will allow the combination of various format images into a single animation, ANIM5 will combine those images which may have different colour maps between frames, so long as the size, number of colours and format does not change either to or from HAM. ANIM3 is similar to ANIM5 but does not allow colour map changes. Sculpt Movie and Impulse animation files are proprietary formats developed by Byte by Byte and Impulse respectively.

LATE NEWS • LATE NEWS • LATE NEWS

NewTek has announced that it will be offering upgrades to MediaShow for Stateside residents who can prove that they already own any Digi- or Elan product. So instead of the $249.95 cover price all they will have to pay is $99.95 + P&P.

This sounds like yet another good deal from NewTek. And by the time you read this in *Amiga Shopper* UK distributors should have announced the upgrade price for us Limeys.

SHOPPING LIST

Elan Performer 2.0........... £179.95
part of the New Tek MediaShow package (with Digi-View Gold and Digi-Paint 3)

from HB Marketing
Unit 3, Poyle 14
Colnbrook
Berks SL3 0DX
☎ 0753 686000

Silica Distribution
1-4 The Mews
Hatherley Road
Sidcup
Kent DA14 4DX
☎ 081 309 1111

CHECKOUT
ELAN PERFORMER 2.0

Ease of Use ●●●●○
Very easy to use.

Features ●●●○○
Simple but effective.

Speed ●●●●○
Fast, with a hard disk and lots of memory.

Documentation ●●●●○
Good if a bit repetitive.

Price ●●●○○
Reasonable (but see note below).

Overall rating ●●●●○

Undoubtedly would be a useful tool for many DTV users.
Note: Price would probably be around £63 if sold separately, but this is only an estimate based on the US price.
Requirements: 1Mb memory (preferably more) and a hard drive will make a huge difference to loading speed. But of course this depends on the size and type of files you wish to present with Elan Performer 2.0.

Video Ease

A TITLER FOR THE COUCH POTATO?

It's a while since I reviewed some cheap and basic titling software for those Amiga videophiles out there who want nothing more than to add some text to their videos with the minimum of fuss. So I was keen to get hold of *Video Ease* and test it on your behalf.

As you have probably gathered by now I try to make sure that if a product claims to be of 'professional' quality then it really should live up to that promise. No such quibbling here – *Video Ease* actually proclaims that it is for 'home users', which I take to mean those who are interested in dabbling in video but aren't particularly serious at the moment. Professional does get mentioned – but only in the context of 'professional looking'.

Arriving in a large plastic box containing a small manual and a single disk, *Video Ease* is not copy protected in any way and can be run from hard disk if you have a little Amiga nouse.

Loading is as normal – either boot from the floppy disk and click on one of the two icons to load either the Medium resolution version or the Interlace version – in case you are averse to the Amiga's flicker (which personally doesn't bother me in the slightest – I've been used to it for a long time now!) – or load the program from hard disk in your usual way (though the manual makes no mention of hard disks), in which case you'll probably have to assign a new path for *Video Ease*'s fonts.

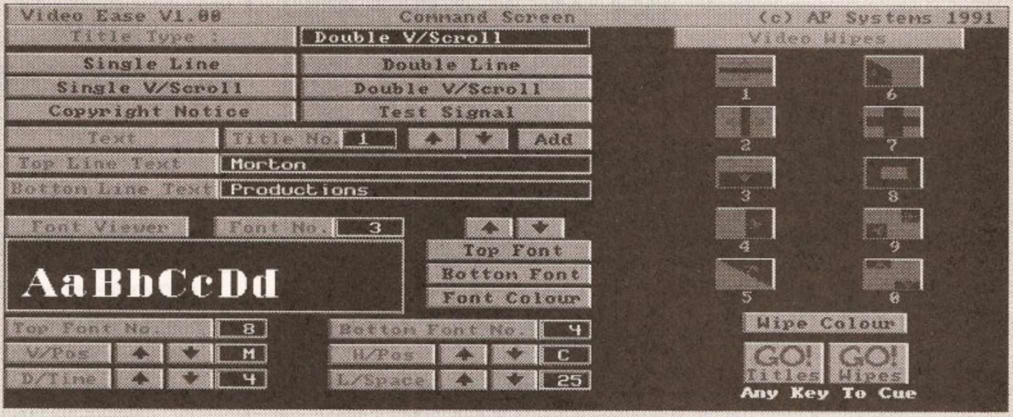
Up comes the only screen you have to deal with. All the functions of the program are available here – which makes sense as there really aren't that many of them (a simplicity aimed at keeping the software accessible to even the daftest DTV-er). This is where you make your choice of display style, font style and colour, display timing and line spacing.

WHAT STYLE PRESENTATION?

There are two styles of text presentation – either as static screens or as vertically scrolling captions. A static page can contain either one or two lines of up to 27 characters each. Text is entered from the keyboard and each separate line can be a different colour and/or font. Only eight fonts can be accessed (and only one size each), though if you can use the CLI or a utility such as Disk Master or SID then you'll be able to edit the font list to your requirements by replacing one or more of the disk fonts with any other suitable Amiga font. Colorfonts are not supported.

You are further limited to a recommended maximum font size of only 38 pixels, which I would consider to be rather on the small side for flexibility (especially with interlaced screens), but which, of course, ensures that the scrolling will always be fairly smooth. The result of this size restriction is that the largest of the provided fonts is 29 pixels high. I did like some of the fonts provided though.

Another feature of *Video Ease* is the wipe panel, where 10 simple wipe effects are available. They are all stand-alone, with no Amiga text or images being used. I would assume that they are simply meant to provide basic transitions between video and graphics.



***Video Ease* provides you with two styles of text presentation, static screens or scrolling captions. It also gives you a basic wipe facility which enables you to trigger or reverse it at the touch of a button**

The wipes are easily selected from the keyboard, with an initial key press actually triggering the wipe and the next one reversing it. Wipes are selected manually, and in any order. None of the wipes can be altered – either in speed or shape, so it's all a bit basic.

I was frustrated to find that *Video Ease* does not utilise the Amiga's multitasking capabilities. Rebooting becomes rather tedious when you want to switch back and forth between other programs in order to edit font lists, access the Shell and do the other small housekeeping operations which help the Amiga user. Whilst I appreciate that this is intended to be in the interests of the inexperienced user, it appears to reduce the life of the software – which could be quickly discarded in deference to a fully operational multitasking titler at a sooner, rather than later stage.

A CAUSE FOR CONCERN

One inexcusable fault is the pointer staying on screen during the text display! Is this for real? The second is that there is no load or save facility – the user has to type in information whenever he needs to caption a video.

I was also concerned about the fact that it took me ages to get the software working in the first place – I just couldn't get it going at all. After proving it worked OK on my old A1000 I was confused until I unplugged the genlock from the RGB port. Only then would *Video Ease* run! Now, I don't know about the programmer, but my idea of video titling would include being able to superimpose words on pictures. A genlock is probably the most obvious way of doing this. OK, I didn't test it out with any other genlocks (so I'm not going to name names), but I was concerned that *Video Ease* just curled up and died without even a whisper of a warning message. If I had only a limited knowledge of Amigas and peripherals I would have been stumped – not the greatest start for the budding Amiga DTV producer!

The documentation is adequate, if skimpy, and the novice user would need some acquaintance with the Amiga environment in order to make the most of *Video Ease*. Nevertheless, I would have to agree with the distributors that the program is definitely aimed at home users, although I would have liked to have seen a little more advice on the use of *Video Ease* within a home video set up.

The bottom line is that I'm sorry to say that I was really hoping for something better from this package. As an easy-to-use program it works fine but as even a home-user titler it could be much better. A lot of great Amiga products came out of 1991 but I'm afraid *Video Ease* didn't quite make the grade.

If you are just starting out in DTV, save your pennies for Scala 500, BAS or even TV Text. Forget *Video Ease*.

SHOPPING LIST

Video Ease........................ £39.95
from Interactive Technology Vision
19 Bond End
Knaresborough
N Yorks
☎ 0423 501321

CHECKOUT
VIDEO EASE

Documentation ●●●○○
Adequate, if assuming, manual.

Features ●●○○○
Not enough even for the DTV novice.

Ease of use ●●●●○
Not hard at all.

Price ●●○○○
A little high, I think.

Overall rating ●●○○○

Good concept let down by poor execution.
Requirements: 1Mb RAM

Fade to Grey



Can the least expensive greyscale hand scanner produce quality images? Jeff Walker investigates...

If it has done nothing else, the release of the Power Scanner has achieved one worthwhile task – it has brought down the price of Amiga greyscale hand scanners to something more affordable.

Pricing the Power Scanner at £99 is a brave move. Prospective customers will no doubt look at the advertising and then ask themselves if it can be as good as a rival scanner costing half as much again. More money usually means more features and higher quality. But not always.

The Power Scanner, like most of its rivals, plugs into the Amiga's parallel (printer) port. However it is unique among Amiga greyscale hand scanners in that it comes supplied with an interface into which both the scanner and the printer can be plugged. In use, switching between scanner and printer is automatic – in other words there is no physical switch to flip or special software to run – but the interface needs to be powered (via the supplied separate power supply unit) for it to work. No power, no parallel port.

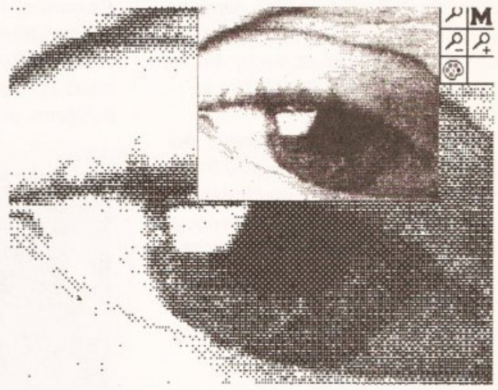
Herein lies the first potential problem. If permanently powered up, will the interface get hot and burn out? Well, I've had this review model plugged in for a couple of months, 24 hours a day, seven days a week, and it doesn't even feel warm. The power supply unit (PSU) is warm, of course, but these widgets are built to stand the heat and can usually be left plugged in for long periods without worrying.

In practice you would probably plug the PSU in at the start of your session and unplug it when finished, just as you would (should!) any other electrical device.

The scanner head is manufactured by Marstek and is the 100, 200, 300 and 400 dpi M-105 Plus model. This is significant because all the rival scanners that use Marstek heads (currently) use the M-105.

The M-105 Plus is an improved design internally and produces better black and white dither patterns for the 64 grey levels than the older M-105 does.

These improved dither patterns result in better quality scans of halftone material like photographs and coloured illustrations. The difference is *very* noticeable. While greyscale pictures converted from black and white dither patterns produced by the M-105 are usually quite dark, even with the brightness wheel at maximum, those produced from the M-105 Plus are brighter and therefore show greater detail.



After scanning a photograph PowerScan displays a large black and white dither pattern representing 64 levels of grey, shown here in magnification

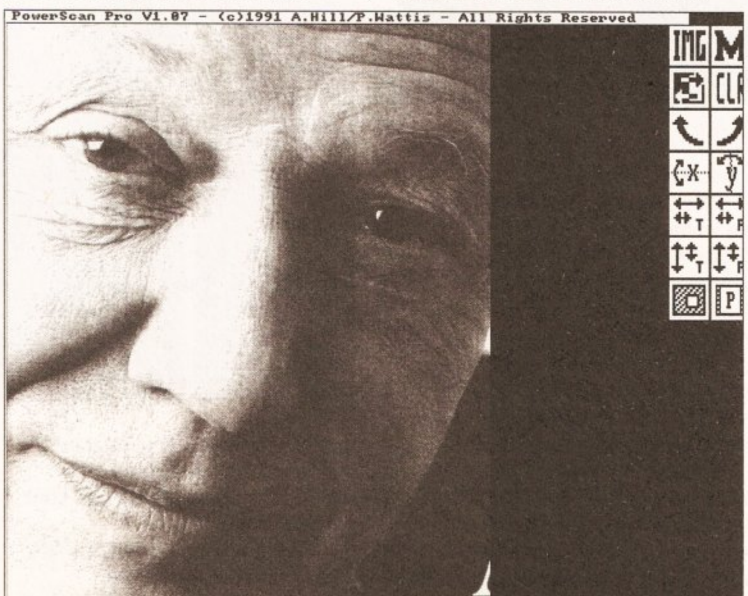
SPECIALLY DEVELOPED SOFTWARE

So on the hardware side of things the Power Scanner currently has the opposition beaten hands down. But the hardware is useless without software.

The *PowerScan Professional* software was specially developed by Power Computing. Initially the company was going to license Pandaal's *DaataScan Professional* software, but after seeing it Power decided that it wanted something with more features.

PowerScan is heavily biased toward creating and manipulating greyscale images. The scan is read in as a black and white dither pattern, of course, but these images are very large and awkward to work with. *PowerScan*'s answer is to convert the black and white dither pattern (which represents 64 levels of grey) to a real 16 grey level image.

In the process the image gets reduced to a quarter of the size of the dither pattern – for instance a default 104mm by 64mm scan at 400 dpi gives a 1,664 pixels wide by 1,024 pixels high, black and white dither pattern. After converting to grey this comes down to 416 by 256 pixels; this image uses less memory and is much easier to work with.



Selecting the Convert to Grey option makes PowerScan turn the black and white dither pattern into a 16 grey shade image, double dithered to give the appearance of 31 shades of grey

The conversion is achieved by the software reading 8 pixel by 8 pixel areas of the dither and converting the pattern it finds in that 'grain' to a shade of grey.

Although the greyscale image contains only 16 actual shades of grey (two of which are pure black and pure white of course), the conversion routine employs a 'double dither' technique which results in 31 'apparent' levels of grey. Instead of the software converting an 8 by 8 black and white grain into a single grey pixel on the screen, it converts it to a 2 pixel by 2 pixel grey level dither. Because pixels are so small the eye sees the 2 by 2 on-screen grain, which will normally contain two actual shades of grey, as a single shade of grey.

Now, this makes you wonder why the scanner head scans in 64 grey levels in the first place. Surely if it scanned 32 grey levels instead the

conversion process would be more accurate? Well, the answer is that the Marstek head is an 'all formats' device, used on many different computers, some of which can display more than the 16 shades of grey that the Amiga can.

MEMORY CONSIDERATIONS

I mentioned the fact that one of the reasons to convert to greyscale was to use less memory. This is a very important consideration with *PowerScan* because it employs only graphics (chip) memory for storing scans. The program itself will load into expansion (fast) memory if you have some fitted, but scans will only use graphics memory.

This restricts the maximum size of scan you can achieve. If you have an old Amiga with only 512k of graphics memory, by the time Workbench and PowerScan have taken their bits for their screens and so on, you will have enough memory left for only a 104mm by 100mm scan at 400 dpi (about 4in by 4in) or 104mm by 170mm (4in by 7in) at 300 dpi.

With more graphics memory, like the 1Mb inside the Amiga 500 Plus, things are a little more comfortable, but even then you won't have enough to scan past 10 inches in length at 400 dpi.

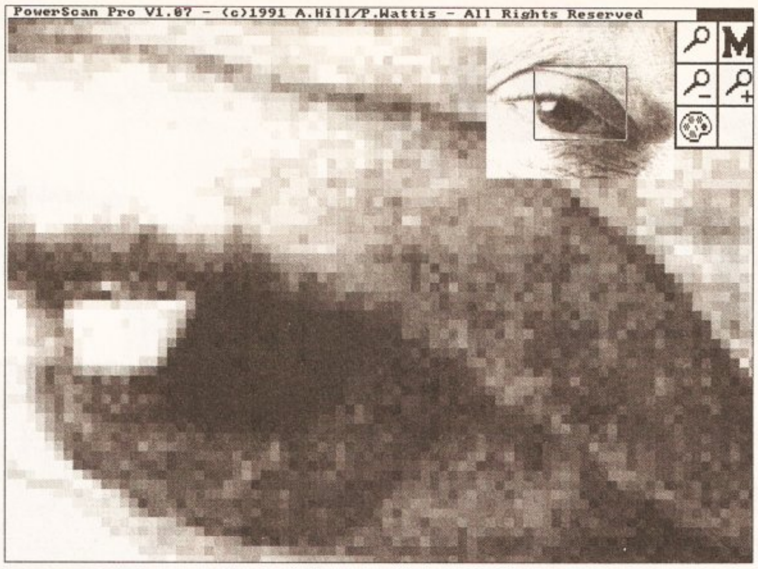
Now, as *PowerScan*'s main use was plainly designed to be scanning photographs and coloured illustrations (although it will of course scan black and white line art perfectly well), and because the originals you will be scanning will for the most part probably be of sizes below the approximate maximums mentioned above, this graphics memory restriction is not as serious as it at first appears.

MEMORY HOG

The programmers believe that the speed gain benefits of using graphics memory far outweigh the maximum scan size drawbacks.

At first I was sceptical. After some months of using the software I am less sceptical, but I am annoyed when I can't multitask with *PowerScan* because an image is hogging all the graphics memory, making it impossible to open windows on the Workbench, let alone run anything. If I wanted to load a *PowerScan* greyscale into *Deluxe Paint* for instance, I would have to save the image and quit *PowerScan* before loading *Deluxe Paint* and importing the picture.

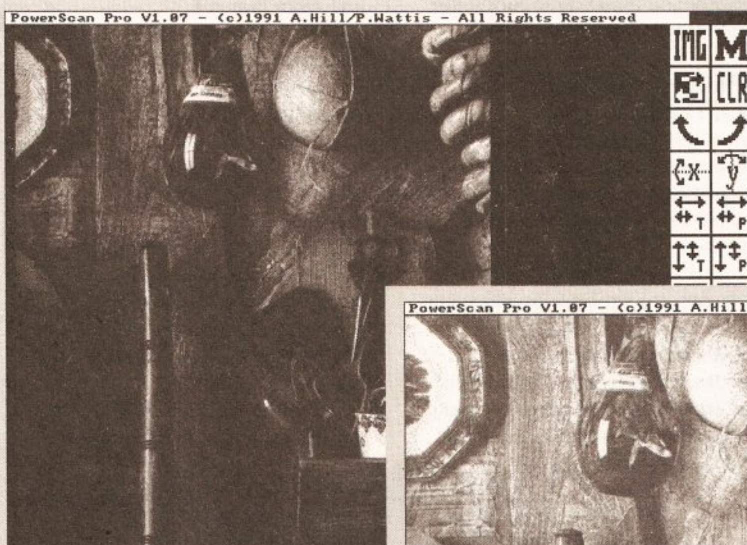
Of course, if you have only 1Mb or 2Mb of memory, you'd probably need to do this anyway, even if PowerScan used expansion memory instead of graphics memory, so I can see the programmers' point of view.

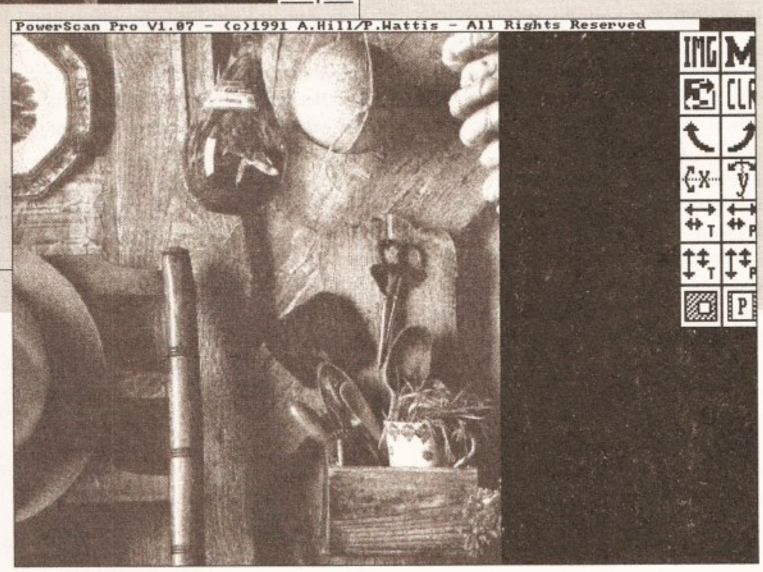


A high magnification detail from the greyscale image showing the intricate pattern of pixels that forms the eye in the 'actual size' window at top right.

WORKING ON THE IMAGE

PowerScan has a number of image manipulation tools, including some drawing tools for freehand sketching, creating lines, boxes, ellipses and polygons, either outlined or filled with a selection of patterns.





These screen grabs show the difference in quality between greyscale scans produced with the old M-105 scanning head and the new M-105 Plus head that comes with the Power Scanner. The M-105 Plus gives brighter and clearer results

The drawing tools are simple and are limited in their use; it's no *Deluxe Paint*, but then it's not supposed to be.

The image manipulation tools are also quite simple. Images can be inverted, rotated in 90 degree increments, flipped horizontally or vertically, and scaled down by 50 per cent horizontally or vertically.

This scaling feature has been thought about. Rather than having just the one 're-scale' button for both directions, there are four – X and Y direction ones for photo scans and the same for text scans. Now, scans only look properly proportioned on-screen in interlace mode (because the pixels are nearer to being square), but if you wanted a greyscale image for, let's say, a disk based presentation and didn't want the problems with larger files, greater memory usage and a flickery interlace screen, you can scale the image by 50 per cent in the Y direction (vertically) and get a med-res, non-interlaced version of the same thing. It's surprising how little detail goes missing.

There are separate buttons for photo and text because the greyscale (photo) images are based on 2 by 2 grains so the software needs to do more than just remove every other pixel to reduce the image to half size, as it does with text scans, which are pure black and white, no greys.

Rotation is useful for scanning something sideways because it is wider than the scanning head, but not higher. After scanning you can rotate it by 90 degrees (either way) so that it is upright again. But if you want to create a slightly skew-whiff picture, rotated by something other than 90 degrees in other words, you can't.

PowerScan has no automatic feature for 'cleaning' a dirty scan – removing isolated black and/or white pixels to put it another way – so if required this has to be done by hand in high magnification mode. This facility is needed most when scanning text that is going to put through some optical character recognition software (something Power Computing is working on).

BRUSH STROKES

There is a clipboard, of course, and this can be scanned separately from the main image.

After scanning, the clipboard is attached to the mouse pointer in the same way that a brush is in an art package. The 'handle' of the brush – the position at which the pointer is attached to the brush – can be changed to any of the four corners, or left in the default central position.

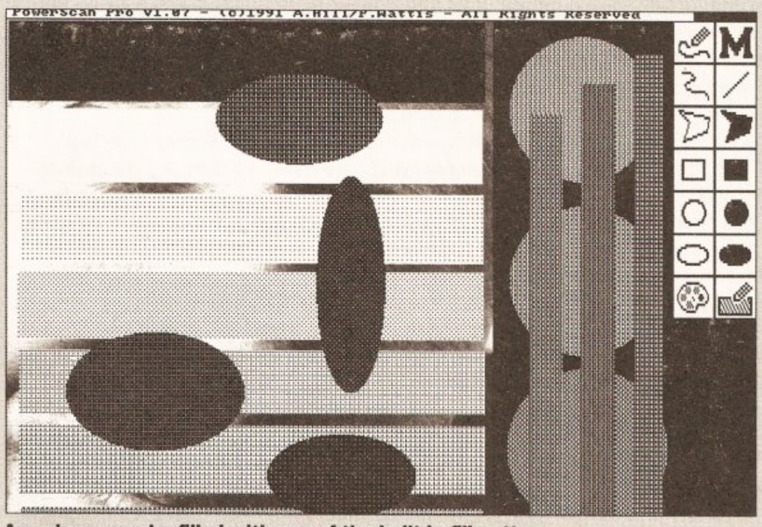
The clipboard's main use is for gluing the two separate halves of a wide image together in order to

get a complete image. For instance, let's say your photo was 150mm wide, then you'd set your scanning width to 150mm and the height to whatever the height of the photo is, scan the left-most 104mm (the width of the scanning head) as the main image, convert to greyscale

> **"The fill patterns have been mysteriously forgotten."**

to reduce memory usage and then scan the right-most 104mm into the clipboard.

Because the main image is a greyscale the clipboard is automatically converted to grey and then attached to the pointer ready for you to overlap the left-hand part of the photo with the right-hand part so that they match up, and then paste the clipboard



Any shape can be filled with any of the built-in fill patterns

down by pressing the left mouse button. The more regular patterns there are in the overlapping part of the images, the more difficult this operation will become.

In fact you may well be thinking that this is an incredibly fiddly and time consuming operation that depends almost entirely upon luck for good results.

And you'd be wrong. Provided you use a straight edge (something heavy that won't move is best) and line it up perfectly vertically for each half of the scan,

it is quite easy to run the scanner head down the straight edge and produce two scans which match up without a join showing. I tried it a number of times, and each time I had to have a few goes, but after a couple of hours I did have four or five greyscale images in which you could not see the join. So there you have it, practice makes perfect.

Scanning two halves of an A4 piece of paper with text on (for OCR) is a different matter. Only a true scanning genius will be able to do this without the aid of a scanning tray.

CROP AND COPY

PowerScan enables you to cut out and copy parts of the main image to the clipboard, and this can be done with a normal rectangular brush, or a lasso type brush that can be drawn around an irregular shape. All the image manipulation process can be performed on the contents of the clipboard as well as the main image.

As well cutting and copying to the clipboard, there is also a cropping feature that lets you drag a rectangle around the area of the main image you want to keep, discarding the rest.

The main image or the contents of the clipboard can be saved in the standard Amiga IFF ILBM format, and *PowerScan* will load any ILBM graphic of four bitplanes (16 colours) or less, automatically converting colours to shades of grey. Graphics can be loaded as the main image or into the clipboard, where they act like a brush.

PowerScan utilises (and is distributed with) the ubiquitous ARP library for its file requester, even when running under Kickstart 2 and Workbench 2 when it should really being using the built-in and much more useful asl.library. But this is a minor quibble.

A Print option allows you to send the main image to an attached and on-line printer, taking its settings from those you have specified in Workbench Preferences. This is a simple graphic dump and there are no facilities from within *PowerScan* to adjust printer density or re-scale the output. And no matter what the width of the main image, *PowerScan* prints it about eight inches wide, adjusting the height to keep the aspect ratio correct. And once the the Print option is selected there is no way to stop the graphic dump short of resetting the computer.

The Print option, therefore, is limited in its use and is almost certainly not required since even the AmigaDOS GraphicDump command can do a better job. I would imagine you'll be using art or DTP software for printer output, anyway.

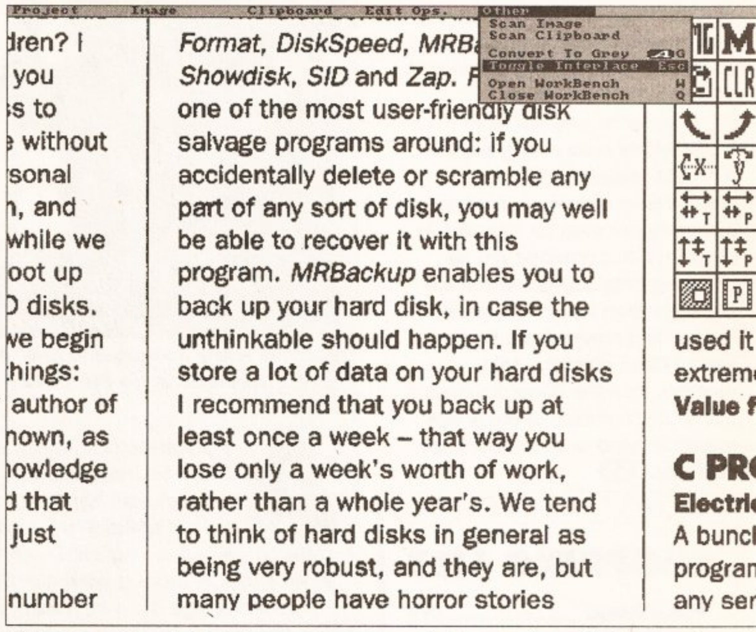
A most useful feature is the screen mode toggle which flips between interlace and non-interlace at a touch of the Esc key. This allows you to save memory by working in med-res, only flipping into hi-res when you need to see the graphic in a more correct aspect ratio. (It'll never be a perfect aspect ratio because even hi-res screen pixels are not exactly square.)

All of *PowerScan*'s features can be operated either from pulldown menus, an on-screen toolbox of icons, or by keyboard short-cuts. The fill patterns have been mysteriously forgotten and are only available on the F4 function key which steps through each pattern one at a time. There is no way of knowing which is the current pattern except by stamping a filled shape on to the image; and there is no Undo option so whatever you stamp on to the image is permanent. This makes saving your image regularly imperative and is a feature I expect will be put right in the version 2 which Power Computing is already talking about.

FINAL THOUGHTS

The documentation for *PowerScan* comes in two forms, a proper printed manual and a ReadMe text file on the disk; the latter is useful for reference purposes as it can be loaded into a word processor and a search performed for every occurrence of the word "clipboard," for example.

The instructions are clear, easy



While PowerScan's forte is creating greyscale images from photos or coloured illustrations, it handles black-and-white text scans adequately

to follow, and include some practical examples of how to achieve certain things.

Hard drive owners are left to install the program themselves by hand, a pet hate of mine because it is so damn simple to write a script or a program to do the job automatically. However, there are only three files to copy across – the program and its icon, plus the arp.library file into LIBS: if you don't already have it there.

Now, the question I suppose you want me to answer is this:"Is the Power Scanner better than all the others?"

Damn, I knew you'd ask that...

Well, the yardstick it has to be measured against is the Gasteiner (née Golden Image) scanner that comes with the excellent *Touch-Up* software. (See the long promised review on page 80.)

There is no doubt that *Touch-Up* can handle larger scans and has more image manipulation features than *PowerScan*. But on the other hand the Power Scanner comes with the newer M-105 Plus scanning head, has an interface with a built-in throughport so you can have the printer plugged in at the same time, and the *PowerScan Professional*

software is faster and beats the current version of *Touch-Up* well and truly into the ground with the quality of its greyscale conversions.

And bear in mind the fact that the Power Scanner is (at the time of writing) about £40 cheaper.

My recommendation is that if you are primarily interested in producing 400 dpi black and white text images for OCR, or black and white dithered halftone images for importing into DTP packages, particularly if they are big scans, then the *Touch-Up* software and Gasteiner scanner is still your best bet, although it may well be worth hanging on until Gasteiner is supplying the newer M-105 Plus scanning head.

If, however, you are more interested in producing greyscale IFF ILBM images for either presentation purposes, desktop publishing, or even for inclusion in programs, and provided you are scanning from originals which are no bigger than about 40 square inches, and provided you have at least 1Mb of graphics (chip) memory, then the Power Scanner is easily the champion of the Amiga greyscale hand scanners currently available. AS

SHOPPING LIST

Power Scanner........................ £99
Available from:
Power Computing Ltd
Unit 8, Railton Road
Woburn Road Industrial Estate
Kempston
Bedford MK42 7PN
☎ 0234 843388

CHECKOUT POWER SCANNER

Hardware ●●●●○
The interface's printer throughport is most welcome.

Software ●●●○○
Lacking some features at the moment, but does the job.

Ease of Use ●●●●○
A few hours use and you'll be an expert.

Speed ●●●●○
Uses graphics memory to speed things along.

Documentation ●●●○○
Not much of it, but enough to get by.

Price Value ●●●●○
Currently the cheapest on the market.

Overall rating ●●●○○
Really wanted to give it four blobs for Overall, but had to knock one off because the software won't utilise expansion memory.



Halftone scans converted to grey levels turn out great (but small) if you don't select double-dither...



...however the more useful size that double-dither produces is spoilt by a nasty 'interference' pattern because of the discrepency between the different matrices used by the scanner head and the software

Touch Up

As promised last month, a look at Version 2 of Touch-Up, the software which comes with the GoldenImage hand scanner. I haven't got hold of MiGraph's scanning tray and Merge-It software yet, nor the Optical Character Reading software, so we'll look at those another time.

Unlike version 1.x, which always runs on the Workbench screen, *Touch-Up 2* can be forced to open on its own screen – two-colour or four-colour, and in interlace if you like. A palette requester has been added so flicker can be reduced on a non-multisync monitor.

It's been upgraded with the new operating system in mind and allows Kickstart 2.x users to specify the degree of overscan. It intelligently recognises which version of Kickstart you're running and will automatically adjust its default palette to suit, and it will use either its own file requester or the KS2.x built-in one.

It is also a little faster than version 1, enough to make the difference noticeable but you will still have to twiddle your thumbs between operations, even with a turbo-board fitted.

Apart from this the main addition to *Touch-Up 2* is a greyscale preview feature, so you can see what the 16 grey level conversion of a halftone scan looks like before saving, thus allowing you to re-scan if it is too dark, too light, too wobbly, or whatever.

Alas, the grey scale conversion routine has not been changed to take into account the 8 by 8 matrix dither patterns (known as 'grains') created by the Marstek 64 grey level scanning head supplied. *Touch-Up* still works out the grey levels by reading the image in 6 by 6 grains, which only works properly with a 32 grey level scanner, like the one MiGraph supplies with Touch-Up. Because of this, in double-dither mode you end up with a horrible chequer-like pattern overlaying the image.

The pattern is too small to discern in single-dither mode, so acceptable 16 grey level images *can* be produced with *Touch-Up*, the problem being that they are quite small. A typical 300 dots per inch 4in by 6in scan of a photograph will be about that big on-screen when converted to greys, but if you're going to use it for DTP then you will need to reduce to at least a quarter that size to get an acceptable output resolution of 300 dots per inch, meaning the size of the published picture comes down to about 1in by 1.5in, which is a bit small really. A double-dithered version would be better because it would be twice as big (although only half the size of the original scanned photograph), and also because there would be 31 'apparent' greys in the picture, thus enhancing the areas of the picture which have subtle changes in tone.

As this undocumented feature (known as a 'bug') has been annoying me no end, I set myself the task of finding a work-around. After a few disastrous ideas bit the dust, it suddenly hit me like a brick in the face – why not use the bug to fix the bug? Sounds silly maybe, but it works.

What you need to do is first scan your image to the full page and then save it. Select the Page/Clip Information tool, change to Pixels measurement (because, then, what we're going to do in a tick will be more accurate) and make a note of the Page size. Let's say for argument's sake that it is 1,600 by 2,400 pixels.

Now reduce those figures by 25 per cent (use a calculator to multiply them by 0.75) and you get 1,200 by 1,800 pixels. Why did we do this? Because the 6 by 6 grains are 25 per cent smaller than the 8 by grains, that's why.

OK, re-set your Page size *and* Clip size to these smaller measurements. When Touch-Up asks whether it should Wipe or Adjust the image, select Wipe. (You did save it first, didn't you?) Now make sure the clip area is visible on-screen (you should be able to see the square control points, or 'handles', around the edges) and select the Ignore item (not Preserve) of the IFF section in the Load Clip tool.

Touch-Up will now import the image into this smaller area, re-scaling it and recalculating the dither pattern in 6 by 6 grains. So now when you convert to grey the conversion routine works correctly, even in double-dither mode, and there is no nasty pattern overlaying it.

The results aren't as good as they would be if *Touch-Up* worked in 4 by 4, 8 by 8, or 16 by 16 grains because some of the detail is lost in the re-scaling process and the image darkens a little, but I think you'll find them acceptable, especially if you experiment with the image processing tools to try and brighten the image before converting to grey.

How to perfect your printing

From Preferences to printouts, Jeff Walker takes on the Herculean task of guiding the Amiga beginner through the hardcopy jungle



"There's nothing more satisfying than seeing yourself in print. If you're new to printing don't miss our Preferences Guide. It's all you'll ever need to know."
Jeff Walker

There are times in the life of every serious Amiga owner when he feels like throwing all his computer kit through the window.

Like when the expensive program you've just bought keeps crashing and nobody can tell you why. Like when you put a data disk in a drive and the Amiga tells you it's not a DOS disk. Like when you put the carefully stored back-up of the data disk in the drive and the Amiga tells you that's not a DOS disk either.

And like when you buy yourself a shiny new printer, rush home, try to print something... and get three reams of garbage.

Printers are a problem. To start with there are several types. Most of us think of a printer as a smallish lump of plastic which drowns out the TV when working, but that's just the most common type of printer, properly known as 'impact dot-matrix'. You've probably heard of three other types of printer, laser, inkjet and bubblejet. But what about thermal printers and line printers? Or band printers? Or dye sublimation printers?

There are probably 50 or so printer manufacturers worldwide, and most make scores of models, leaving us with a few thousand different printers to choose from, most of which are 'old' models inasmuch as they have been superseded by later and better versions which are almost, but not quite, the same.

It's certainly a jungle out there, but armed with at least a little knowledge it is actually a lot easier than it may at first seem to hack your way through the undergrowth.

PASS THE PORT

At the simplest level there are only two types of printer – those that plug into the serial port and those that plug into the parallel port.

The differences between the serial port and the parallel port are not complicated. Data sent down the serial port goes one 'bit' at a time. One ASCII character consists of eight bits – one 'byte' – so to print a letter A, for example, the eight bits which make up the ASCII code for that letter have to be sent one after the other – in single file, if you like.

If you could send all eight bits of a character at once, printing would be quicker, yes? Well this is what happens to data sent down the parallel port – all eight bits that make up the ASCII code travel together down eight separate but parallel lines, and all arrive at the printer at the same time.

Most printers these days have parallel interfaces, some have both parallel and serial (or the option to fit either), a few still have only serial interfaces.

At the next level of understanding there are the different ways that printers actually make marks on the page.

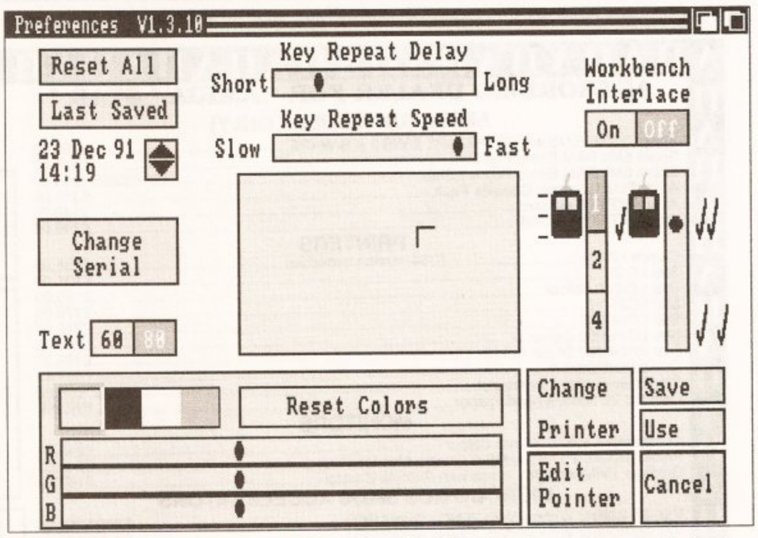
Impact dot-matrix printers work by making little pins strike an inked ribbon, thus transferring a pattern of dots on to the paper on the other side of the ribbon. The cheapest type of impact dot-matrix printer has only 9 pins in its 'print head' and consequently the quality is not high because the characters it produces are made up of only a few quite large dots. The next step up is 18-pin printers which (obviously!) have more pins, and the pins are smaller meaning that the dots they produce are smaller and so the characters they produce are of a higher quality.

Currently the most popular impact dot-matrix printers are the 24-pin variety, but there's at least one 50-pin impact dot-matrix printer available, the Mannesmann MT98, which manages somehow to emulate the Hewlett-Packard DeskJet Plus inkjet printer.

Inkjets and bubblejets use different methods to spray ink from a reservoir or cartridge on to the paper. Both are also dot-matrix printers because the characters they print are constructed from a matrix of dots, just like impact dot-matrix printers except that the dots are a lot smaller, which means that the characters are of a higher quality than impact dot-matrix, even though the claimed dots-per-inch (dpi) resolutions may be the same or similar.

Believe it or not, laser printers are also dot-matrix printers, for exactly the same reason that inkjets and bubblejets are. Laser printers use heat to glue extremely fine particles of 'toner' on to the paper, and because the toner isn't wet (like ink is) there is no chance of getting fuzzy output from the ink soaking into the paper and 'spreading'. You get very sharp edges with laser printers.

These three are the most popular types of printer. On the periphery, and becoming more popular in the professional world as prices drop, are thermal printers which require special (and expensive) heat-sensitive paper. These are mostly very high quality 300 dpi colour jobbies that are designed to be used with the Apple Macintosh, although most have parallel interfaces and can emulate Hewlett-Packard laser printers – and some have PostScript built-in – so we Amiga owners can use them too. (Prices range from about £300 for the very slow black-and-white Citizen



The main Preferences screen of Workbench 1.3. From here you can click on 'Change Printer' and go on to make all the printer decisions you need

PN48, through about £7,000 for the NEC Colormate PS/80, right up to about £40,000 for the 40 pages-per-minute Brother SL-40PC.)

WORDS AND PICTURES

Printers can print two types of things, graphics and text. The way in which printers print text is simpler to understand so we'll start with that.

To be able to print, printers have to speak a language. I don't mean English or French, I mean a language as in programming language.

A programming language is defined by its syntax and all the different keywords and data structures it uses; the language a printer speaks is defined by things called 'control codes'. It's these control codes which cause all the trouble. For instance, a control code that tells one model of printer to set the page length to a certain number of lines might tell another model of printer to set the character pitch to condensed. To get around this problem the Amiga uses programs called 'printer drivers'.

But we're running ahead of ourselves, let's learn to walk first...

The basis of all printer languages is ASCII – the American Standard Code for Information Interchange. There are 256 ASCII codes, numbered from 0 to 255. Every character you type at the keyboard has an ASCII code – A, for instance, has an ASCII code of 65, B is 66, C is 67. Lower case letters and punctuation marks all have ASCII codes too, as do some common foreign letters and some common symbols like® and £. Even 'non-printable' things like carriage returns and backspace have ASCII codes.

When a printer is printing ASCII data – letters, numbers, punctuation, symbols, carriage returns and so on – it knows what to print because the software has sent the ASCII code for that character. But what if the software wants to tell the printer to switch to condensed characters? How does the printer know that the ASCII code the software has sent to it is a command to do something and not a character to print? This is where the 'escape' code comes in, which is normally written as ESC.

ESC has an ASCII value of 27 and when the printer receives this code it knows that the very next ASCII code it receives will be a command to do something. Depending on what that code is, there may very well be one or more codes following the command that are the 'parameters' to that command. The printer command ESC x, for instance, might mean 'print quality', but not until the printer receives a following 0 or 1 does it know whether it needs to switch into draft quality or letter quality.

So the full printer command to switch letter quality on might be written ESC x 1, and these three elements together comprise the printer 'control code' for Letter Quality ON.

That's how they are normally written, but another way is to use the ASCII codes for those characters – 27 120 49 means exactly the same thing; 27 is the ASCII code for the escape code, 120 is the ASCII for the 'x' character and 49 is the ASCII for the '1' character. (Yet another way is to write the numbers in hexadecimal form instead of decimal, which would be 1B 78 31, but we won't confuse matters by going any further down this road.)

So, in general, printer control codes consist of the escape code, the printer command, and sometimes one or more parameters, which can be though of as 'data for the command' if you like.

I say 'in general' because there are a few control codes which don't need to be preceded by the escape code. The ASCII codes from 0 to 31 are 'non-printable' characters and, depending on your printer, some of these are employed to control certain things. Epson compatible printers, for example, can be switched into condensed printing mode by sending just the ASCII code 15, and every printer I know of recognises the ASCII code 12 as the command to advance to the top of the next page, known as a 'form feed'.

DRIVING FORCE

Before we get on to printer drivers, let's look at a real example of how the same sequence of ASCII codes can mean different things to different printers. For the sake of this example imagine that printer drivers haven't been invented yet.

OK, I've got an Epson LQ-500 printer and I want my letter to be printed out so that there are eight lines of text to every inch – ie 1/8th of an inch line spacing. So at the top of my document I insert the control code to make the printer do this. The control code is ESC 0, or 27 48 in decimal. (Exactly *how* you insert control codes into documents, or whether you can, depends upon the specific software you are using.)

Brilliant! I printed it and it worked a treat.

Now I send the document to a friend because he wants to print it on his Okimate 20 colour printer. Only instead of getting eight lines to the inch the whole document is printed out with the default 1/6th of an inch line spacing in his printer's Data Processing quality (what the rest of the world calls 'draft' quality).

This is because to an Epson compatible printer the ESC 0 control code means change to 1/8th of an inch line spacing, while to the Okimate 20 printer ESC 0 means switch into Data Processing print quality.

With me so far? Good.

So let's invent the printer driver.... Ah, but hang on a moment, if the document is sending ESC 0 to the printer, how will the printer driver know whether we mean 1/8th line spacing or Data Processing quality, or whatever else ESC 0 may mean to any other printer?

It can't know. It doesn't matter what *you* mean it to do, if ESC 0 is sent to the printer, the printer will do whatever ESC 0 means to *it*.

We need another standard. We need a set of codes that the printer driver (not the printer itself) understands, which can then be translated into whatever control codes are correct for the printer the driver is meant to work with.

That standard was invented by the American National Standards Institute (ANSI) and the Amiga's printer device (PRT:) recognises 77 of these ANSI commands.

Going back to our example, the ANSI command for 1/8th of an inch line spacing is ESC[0z. So if our document sends that command to the PRT: device, the printer driver will intercept it and understand that we want 1/8th of an inch line spacing and send the correct control code to the printer – an Epson LQ-500 driver would send ESC 0 to the printer, whereas an Okimate 20 driver would send ESC 8.

FINDING FAULT

There is one major fault in this system – if the Amiga's printer device doesn't recognise the ANSI code for what you want the printer to do, you can't do it.

Unless, that is, you bypass the printer driver and send specific printer control codes straight to the printer.

Now I've got a feeling I might have been going through this concept a little too quickly, so let's recap on the two ways that software can send data from the Amiga to the printer:

- It can do it 'by the book' – the software sends ANSI commands to the PRT: (printer) device, which are

continued on page 87

WHAT ARE DIP SWITCHES?

Printers can be set up to work in many different ways. It is possible to arrange it so that each time you switch on the power your printer is ready to work in exactly the way you want it to. To do this you simply alter the settings of small switches known as DIP (Dual In-line Package) switches.

Every printer has a different number of DIP switches which are specific to that model of printer, so it is impossible to provide a fool-proof guide to what they mean. However there are a number of things for which most printers have DIP switches, and some of these are quite important.

Firstly there's the page length. One of the DIP switches will be used to tell the printer whether the page length is 11 inches or 12 inches. If this switch is left on the 11 inch setting and you use A4 sized paper (which is longer than 11 inches), the paper will always feed out when it reaches 11 inches, print the rest of the page on the next piece of paper, which is often only three or four blank lines, and then feed out again because there is a 'form feed' control code in the document at the end of the page. To the unknowing user it would appear that the printer is feeding out an extra blank sheet after every printed page.

So find which DIP switch sets the default page length and switch it to the 12in setting. If you are using a cut sheet feeder (often abbreviated to CSF), check first to see if your printer has a DIP switch for A4 paper.

Another one to look out for is the Skip-over Perforation switch. If you are using fanfold paper and this is set to ON, then the printer will always provide a margin between the last printed line on one page and the first printed line on the next, usually about one inch.

If the first printed line on a sequence of pages is getting lower and lower on the page, turn the Skip-over Perforation switch OFF. (Some software will allow you to do this in a Print requester.)

Lastly there's the character set. If you are getting # instead of £ then it's likely that your printer is using the USA character set instead of the UK one. Check your printer manual and find which DIP switches have to be set to ON and OFF to specify the UK character set as default. Three or four DIP switches are normally employed for this purpose.

Preferences Guide

Here it is, the most comprehensive guide to Amiga printer preferences ever published...err...probably

Make no mistake – setting up your printer can be a frustrating experience. Unfortunately, the documentation that comes with your Amiga does little to alleviate the problems you are likely to come across. That's where *Amiga Shopper* comes in, of course.

This guide to the printer preferences screens for both Workbench 1.3 and 2.04 gives details and explains away the mystery of every single option available to you. More often than not, you'll find that your printing problems can be solved by choosing the correct printer driver and getting the right preferences settings.

Now read on, and find out exactly what each of those settings does...

CHANGE PRINTER

1. PARALLEL INTERFACE
Select this button if your printer has a parallel interface and is connected to the Amiga via a parallel cable to the parallel port.

2. SERIAL INTERFACE
Select this button if your printer has a serial interface and is connected to the Amiga via a serial cable to the serial port.

See also items 42-50 concerning the serial settings in the Change Serial requester.
NOTE: Workbench 2.0 users select parallel or serial printing by clicking on a single cycle gadget, as is the case with many of the options detailed in this article. In these cases, you will see several circled numbers clustered around the same screen gadget in the diagrams.

3. PRINTER TYPE
This is where you select the correct printer driver for your printer. The list that appears will be taken from the files inside the DEVS:printers directory. This directory is on the disk you booted from (usually your Workbench disk), unless you have reassigned the DEVS: logical device elsewhere.

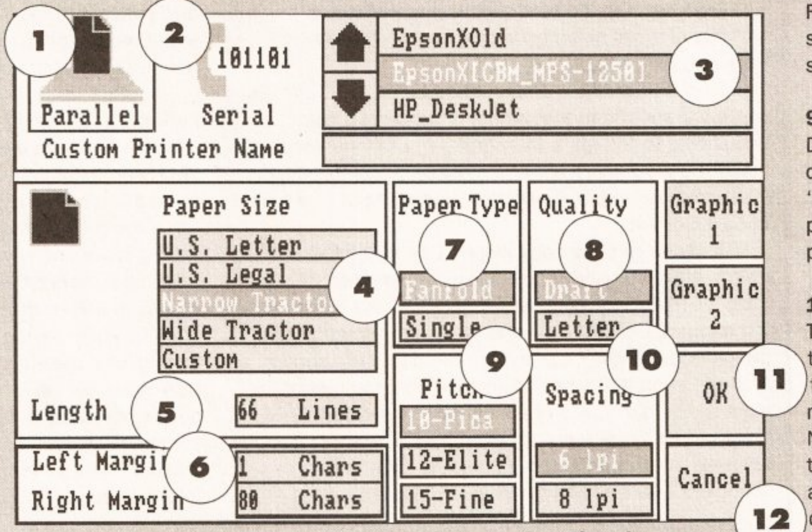
The empty text gadget underneath the list of printer drivers, which in 1.3 Preferences is labelled Custom Printer Name, can be used to supply a path and filename to a printer driver which isn't kept in DEVS:printers. For example, if you had all your printer drivers on a single disk called Drivers, you could click in the Custom Printer Name gadget, type Drivers:drivername, and Save that setting. After doing this, the first time you try to print something a System requester will pop up asking you to insert volume Drivers in any drive (assuming it isn't already inserted, of course) after which the printer driver called drivername will be loaded. Once loaded, the printer driver remains in memory until a re-boot, so you'll only need to insert the Drivers disk once.

In 2.0 Preferences the same thing can be achieved by typing a custom path and filename into the text gadget at the foot of the printer drivers file requester.

4. PAPER SIZE
There are four preset paper sizes under Workbench 1.3: US Letter (which measures 8.5 inches by 11 inches), US Legal (8.5in x 14in), Narrow Tractor (9.5in x 11in), and Wide Tractor (14.875in x 11in). The last two allow for an extra half inch either side of the paper to make up for the perforated strips of fanfold (or 'tractor fed') paper.

Two others are supplied with Workbench 2.0: DIN A4 (8.3in x 11.7in) and DIN A5 (5.8in x 8.3in).

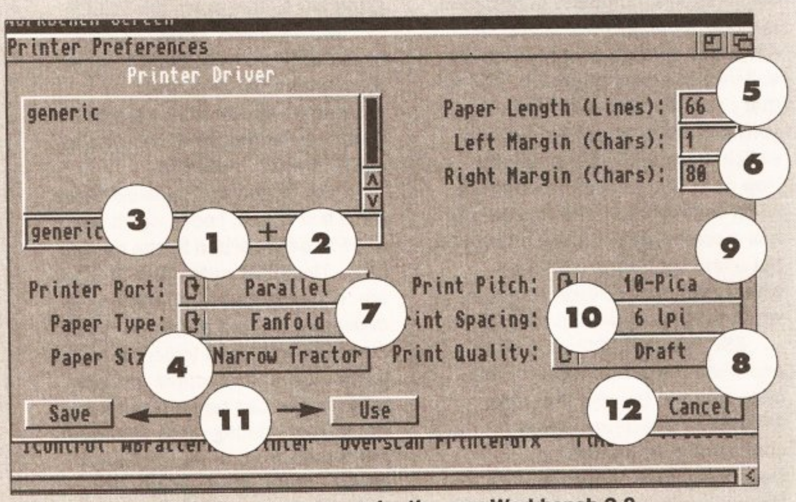
5. LENGTH
This is where you enter how many lines of text will fit on to the size of paper you are using. This depends on what line spacing you have set (see 10). For the four preset sizes the length is 66 at six lines per inch (lpi) and 88 at eight lines per inch. For A4 paper it is 70 at 6 lpi and 93 at 8 lpi.



Main screen of the Preferences' Change Printer section – from here you can choose the correct printer driver

6. LEFT & RIGHT MARGIN
These settings specify how far from the left edge of the paper printing will begin, and how far from the right edge printing will stop.

These figures are specified in characters and the actual distances depend on the Pitch setting (see 9). At normal 10 characters per inch (cpi) printing the Right Margin setting for A4 paper should be no greater than 82, at 12 cpi it should be no greater than 98, at 15 cpi the maximum is 123.



The equivalent Preferences screen under the new Workbench 2.0

7. PAPER TYPE
Select Fanfold if you are using continuous stationery: select single if you are using single sheets. Having said that, if your printer has a paper feed tray in which you can stack a pile of paper (like laser printers do), select Fanfold because in effect you are using continuous stationery as sheets of paper can be fed through automatically without your help.

8. QUALITY
For faster but lower quality printouts select Draft; for higher quality but slower printouts select Letter.

9. PITCH
Determines the width of the printed characters. 10-Pica (pronounced 'piker' not 'peeker') is 10 characters per inch; 12-Elite is 12 characters per inch.

10. SPACING
This determines how close together the printed lines of text are: 6 lpi is the normal setting; 8 lpi will get more lines on to a page (see 5).
NOTE: Some applications will use the Length (5), Margin (6), Pitch (9) and Spacing (10) settings to determine how large the paper is, rather than the Paper Size setting. Therefore, if printouts are coming out badly, check you have these preferences set up correctly.

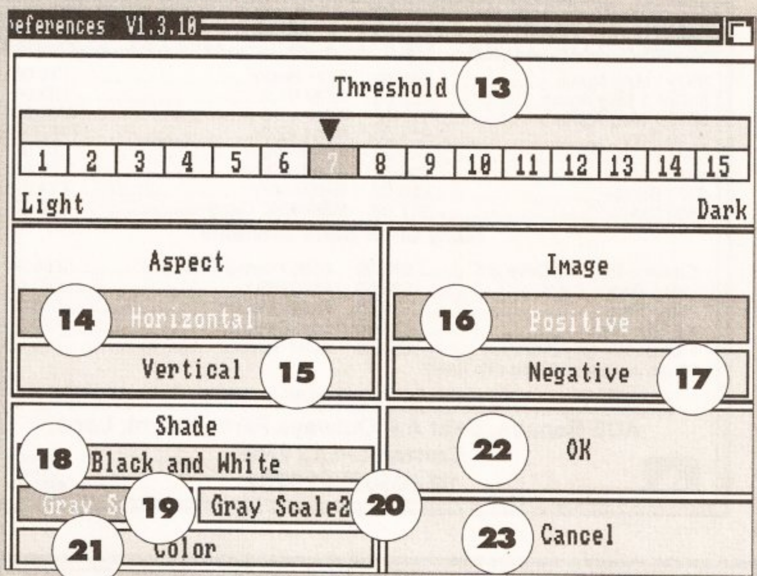
11. OK
(SAVE/USE under Workbench 2)
Confirms changes you have made on this page and takes you back to the first page of Preferences.
NOTE: Workbench 2 users have the choice of just using the changes for the rest of the session until the next reset or of saving them to the disk for future use.

12. CANCEL
Cancels any changes made then returns you to the first page of Preferences.

GRAPHIC 1

NOTE: With Workbench 2.0, this and the Graphic 2 screen have been replaced by the single PrinterGFX screen.

13. THRESHOLD
This is for black-and-white output only, no grey level shading to represent colours. The setting determines at what point on-screen



Graphic 1 – one of the Workbench 1.3 screens for conrolling graphics output

colours will be printed as solid black or solid white, depending on whether you have selected a Positive or Negative image. When the image is set to Positive, the lower the Threshold setting the lighter are the colours that are printed as black.

14. ASPECT HORIZONTAL
Select this if you want the top of the on-screen graphic to appear along the horizontal top of the paper, that is as it looks on screen – known as portrait.

15. ASPECT VERTICAL
Select this if you want the graphic to be printed sideways (aka landscape) so that the top of the graphic appears on the vertical side of the paper.

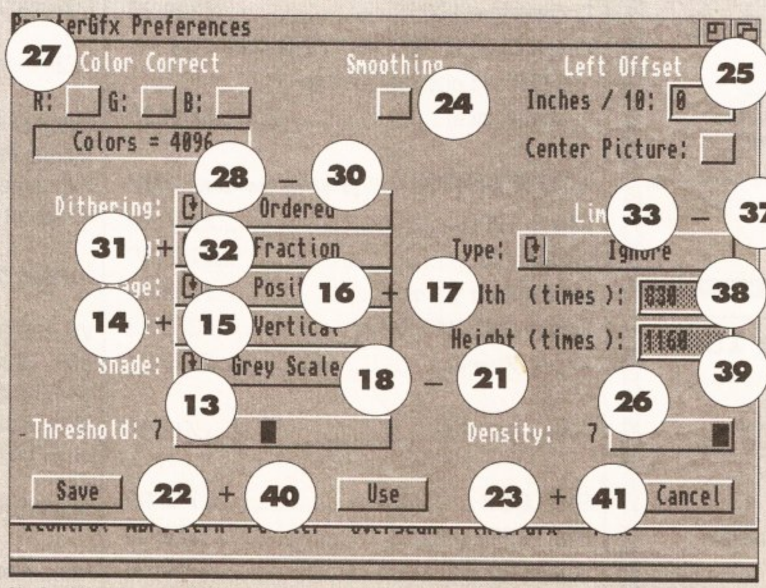
16. IMAGE POSITIVE – Select this if you want the graphic to be printed as it appears on the screen.

17. IMAGE NEGATIVE
Select this if you want the graphic to be reversed; on-screen black will be printed as white, light colours will be printed as dark grey levels, dark colours will be printed as light grey levels, white will be printed as black.

18. SHADE BLACK AND WHITE
Select this if you want black-and-white printouts, where some colours print as black and some print as white, no in betweens (see 13).

19. SHADE GREY SCALE
Select this if you want the printer to represent on-screen colours as different levels of grey.

20. SHADE GREY SCALE 2
Select this only if you have an A2024 monitor (or another 4 grey-shades monitor) and want the graphic dump to appear exactly as it does on-screen in the same 4 grey shades grey as the monitor shows.



Under Workbench 2.0, both have been incorporated into a single screen

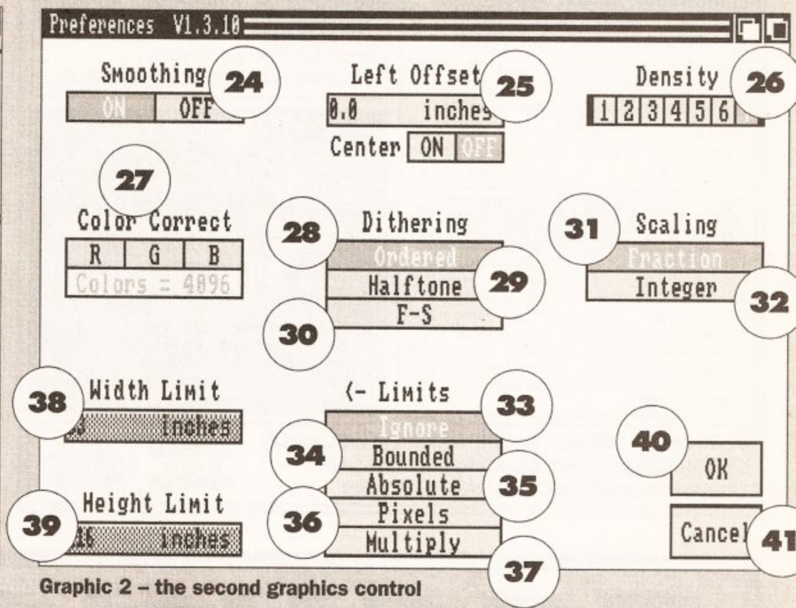
21. COLOR
Select this for colour output if you've a colour printer.

22. OK (SAVE/USE)
Confirms any changes you have made since you opened this page and returns you to the Change Printer page.

23. CANCEL
Cancels any changes you have made since you opened this page, then returns you to the Change Printer page.

GRAPHIC 2

24. SMOOTHING
If you set this to ON an attempt will be made to smooth diagonal lines.



Graphic 2 – the second graphics control screen

This is best used with programs that do graphic dumps of text (*Notepad, Pen Pal, Wordworth, KindWords*, et al). Output is twice as quick (and is, almost as good) with smoothing off.

25. LEFT OFFSET
The distance in inches from the left edge of the paper that the graphic dump should begin – a left-hand margin.

Switch Center ON if you want the dump to be centred between the left and right edges of the paper (doing so will override the Left Offset value).

26. DENSITY
Selects the graphics output density (also called dots per inch (dpi) resolution). The actual dpi values are determined by the printer driver. The lowest resolution is 1, the highest 7.

Some printers (and printer drivers) will have fewer than seven resolutions; laser printers, for example, typically have only four resolutions and these will be on 4 (lowest), 5, 6 and 7 (highest). In these cases settings 1-3 will usually be the same resolution as setting 4.

27. COLOR CORRECT
This is very complicated to explain, and very difficult to get right. Basically, this option attempts to match the colours which are produced by the colour printer to those colours on screen. Without colour correction the printer can print all 4,096 colours displayed by the Amiga, with RGB colour correction switched on the total number of printable colours is reduced to 3,172.

You will need to experiment with mixtures of the R, G, and B buttons on and off to see which setting is best for your particular colour printer.

28. DITHERING ORDERED
This should be used to give the best results if you are printing either Grey Scale (see item number 19) or Color (see 21) shades at a low resolution (see 26) of 150 dots per inch or below.

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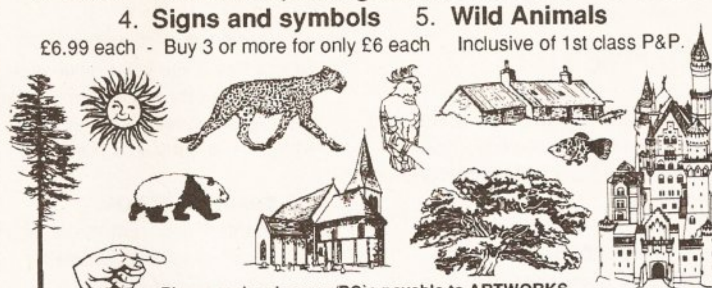
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29. DITHERING HALFTONE
Gives the best results if you are printing Grey Scale (see 19) or Color (see 21) shades at a high resolution (see 26) of 150 dpi or above.

30. DITHERING F-S
F-S stands for Floyd-Steinberg. This dithering method distributes the dots randomly, the advantage of this being that it is no longer possible to identify any one pattern in the finished picture. It gives the best results if you are printing Grey Scale (see 19) or Color (see 21) shades at a low resolution (see 26) of 150 dpi or below. F-S dithering takes twice as long as the other two methods and cannot be used in conjunction with Smoothing (see 24).

31. SCALING FRACTION
Normal scaling is performed – useful for pictures with lots of shading.

32. SCALING INTEGER
If this is activated every pixel on the screen is guaranteed to appear as an even number of dots on the printout in both the X (horizontal) and Y (vertical) directions. For example, if the graphic is 320 by 256, the printed picture will be 320, 640 or 960 dots wide (and so on); the height will be 256, 512 or 768 dots (and so on). This option is best when a picture contains lots of thin vertical and horizontal lines, like a grid.

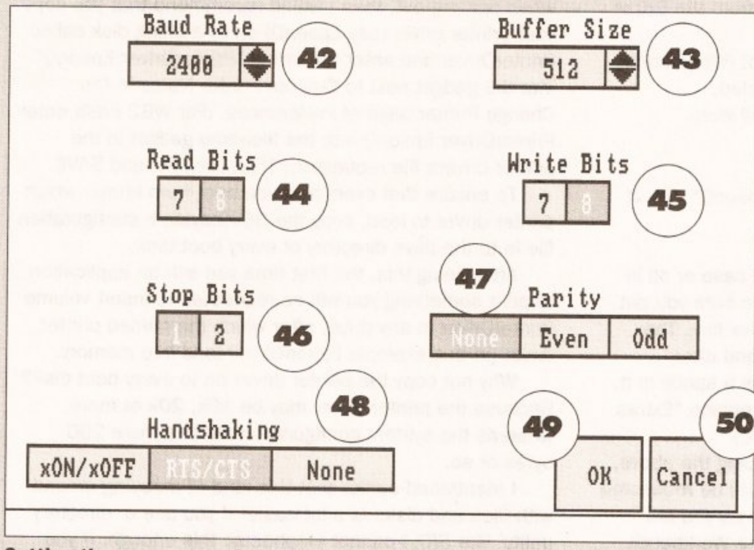
33. LIMITS IGNORE
With this the picture's printed size is determined by the size requested by the application, bounded horizontally by *(Right Margin – Left Margin + 1) / Pitch* (see 6 and 9), and bounded vertically by *Length / Spacing* (see 5 and 10).

34. LIMITS BOUNDED
With this selected the printed picture's size is bounded by Width Limit and Height Limit (see 38 and 39). The picture is printed as large as possible within these limits, the correct aspect ratio of height to width being maintained.

35. LIMITS ABSOLUTE
With this selected the printed picture's size is no longer bounded. Instead it will be printed the absolute size specified by Width Limit and Height Limit (see 38 and 39). This completely overrides the aspect ratio so can result in distorted looking pictures.

36. LIMITS PIXELS
With this selected the Width Limit and Height Limit figures (see 38 and 39) are interpreted as pixels instead of tenths of an inch. Apart from this the same rules as for Absolute apply (see 35).

37. LIMITS MULTIPLY
With this the Width Limit and Height Limit figures (see 38 and 39) are used to multiply the picture's width and height. For example, if you specified a Width Limit of 2 and a Height Limit of 4, the printed picture would be twice the picture's width and four times the height, in pixels.



Setting the parameters for the serial port under Workbench 1.3 – only needed for a serial printer

The same rules as for Absolute. Integer Scaling (32) works well with this option.

38. WIDTH LIMIT
Limits the width of a printed picture in tenths of an inch (see 34 and 35), pixels (36) or a multiplication factor (37).

39. HEIGHT LIMIT
Limits the height of a picture in tenths of an inch (see 34 and 35), pixels (36) or a multiplication factor (37). When the Width Limit is specified and the Height Limit is at zero, the picture keeps its correct aspect ratio in Absolute, Pixels and Multiply mode.

40. OK (SAVE/USE)
Confirms any changes you have made on this page and returns you to the Change Printer page.

41. CANCEL
Cancels any changes you have made on this page and then returns you to the Change Printer page.

CHANGE SERIAL

Change these settings if you have chosen Serial (see 2) on the Change Printer page. You'll need to work in conjunction with your manual to ensure that these settings are correct for your printer.

42. BAUD RATE
The number of bits sent along the serial cable each second. Click on the up and down arrows to change the setting. Most serial printers are capable of communicating at several baud rates – choose the highest.

43. BUFFER SIZE
An area of memory set aside for serial communication. The printer sends the data to the buffer, when the buffer becomes full the data is sent to the printer. As data leaves the buffer, so more data is sent to it by the computer, until all the data has been sent. The larger the buffer, the faster the printout.

44. READ BITS AND WRITE BITS
The number of bits expected for reception and transmission of each character. Most commonly set to 8 for both.

Under Workbench 2.0, only one value is given for both.

NOTE: The Read Bits and Write Bits are normally referred to in printer manuals as one thing called Data Bits. If the manual says 8 data bits then set Read and Write Bits to 8.

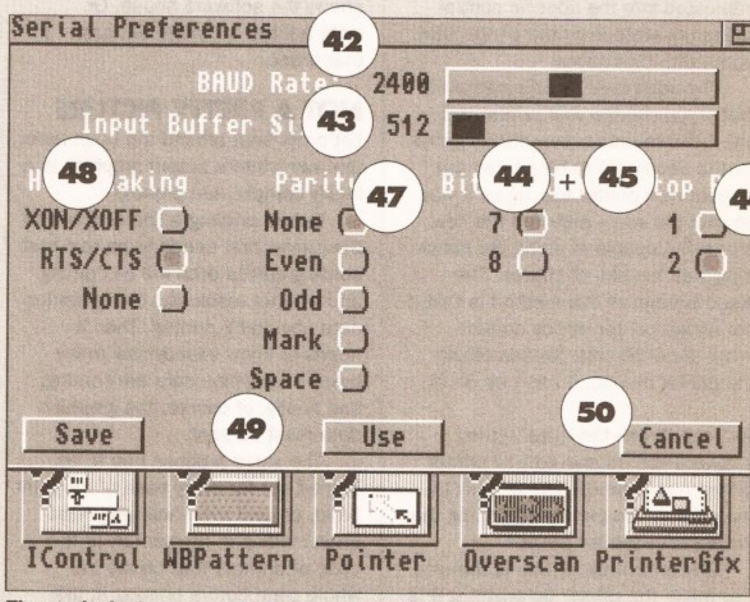
46. STOP BITS
The number of bits that are added to the end of each character to mark where it ends. It is most commonly set to 1. Some printers, however, require a Start Bit as well as a Stop Bit. If this is the case with your printer, set Stop Bits to 2.

47. PARITY
This is a data checking method which is used to reduce transmission errors. Most commonly set to None.

48. HANDSHAKING
The method used to control the flow of information through the serial port. xON/xOFF is the most common method. If your manual doesn't mention handshaking, select None.

49. OK (SAVE/USE)
Confirms any changes you have made on this page and returns you to the first Preferences page or, in the case of Workbench 2, it returns you to the initial Preferences window.

50. CANCEL
Cancels any changes you've made since you opened this page, then returns you to the main Preferences screen.



The equivalent screen under the new Workbench 2.0

FINAL NOTE
Remember that you need to select Save on the first Preferences page if you want the changes you have made on any or all of the other Preferences pages to be permanent.

HOW TO INSTALL A PRINTER DRIVER...

Printer drivers are best copied into the 'devs/printers' directory on the disk you boot from (your 'boot' disk, usually Workbench) – that means into a directory called 'printers' which is inside a directory called 'devs'.

Normally at startup the devs directory on the disk you boot from is assigned the logical name DEVS:, so if you see DEVS: mentioned below you know it means the devs directory on the disk you booted from, which is normally your Workbench disk.

For the purposes of this example we'll go through the steps required to copy the EpsonQ driver from the Extras disk on to your Workbench disk.

1. Boot from Workbench. Leave your boot (Workbench) disk in the drive, it needs to be write-enabled.

2 Open a Shell (double click on the Shell icon).

3. At the prompt type:

```
Copy "Extras 1.3:devs/printers/EpsonQ" TO ↵
DEVS:printers
```

It doesn't matter if you type it all in upper case or all in lower case, or mixed (as above). But make sure you put spaces only where they appear in the above line. The double quotes are needed before Extras and after EpsonQ because the name of the disk has a space in it. (If you've renamed your Extras disk then replace "Extras 1.3" with whatever you've called your disk.)

4 Press the Return or Enter key after typing the above.

If you have only one floppy drive you will be requested to swap disks at certain points; simply do as you are asked. If the driver won't copy because the Workbench disk is full, you will have to delete something from that Workbench disk (eg tools in the Utilities drawer will do).

This kind of file management is much easier to do with a 'directory utility'. Speak to your local PD library about this. There are lots of them to choose from, the most popular is called *SID*.

5. After you have copied the driver on to your boot disk you need to run the Printer program in the Prefs drawer on the Workbench disk. After double clicking the Printer icon you will go to the Change Printer page of Preferences and you will see a list of drivers at top-right of the screen. Use the mouse and the arrow buttons to highlight the new driver, then click on the SAVE button. That's it.

If you boot from many different disks and want to ensure that the same (and correct) printer driver is used when printing out, then I would recommend that you copy your printer driver (say EpsonQ) on to a blank disk called PrinterDriver and enter the string "PrinterDriver:EpsonQ" into the gadget next to Custom Printer Name in the Change Printer page of Preferences. (For WB2 Prefs enter PrinterDriver:EpsonQ into the filename gadget in the printer drivers file requester.) Then click OK and SAVE.

To ensure that every disk you boot from knows which printer driver to load, copy the DEVS:system.configuration file in to the devs directory of every boot disk.

After doing this, the first time you ask an application to print something you will be requested to insert volume PrinterDriver in any drive, after which the named printer driver (in this example EpsonQ) will load into memory.

Why not copy the printer driver on to every boot disk? Because the printer driver may be 10k, 20k or more, whereas the system.configuration file is a mere 200 bytes or so.

I mentioned earlier that this kind of messing around with files and disks is a lot easier if you use a 'directory utility' like *SID*. I cannot emphasise this enough. If you don't already own one, I strongly recommend you acquire such a program. If you want the absolute best, there is a commercial one called *Directory Opus* which costs about £40. You can get it from Checkmate Digital ☎ 071 923 0658. Believe me, it will transform your life.

---

interpreted by the printer driver and translated into the specific control codes understood by the printer that works with that driver.

The advantage of this method is that if you change your printer you only need to load a new printer driver for the document to be printed out on your new printer exactly as it was on your old one – provided the new printer is capable of doing the same things as the old, of course. The disadvantage of this method is that if the Amiga printer device doesn't know the ANSI code for something the printer can do, it can't be done.

● It can 'break the rules' – the software has its own type of printer driver(s) and sends data directly to the printer, completely bypassing the Preferences printer driver.

The advantage of this is that you can make the printer do anything it is capable of doing by sending 'raw' printer-specific control codes. The disadvantage is that if you change your printer you may have to change all the codes in your document(s) to the equivalent for the new printer.

To find out which method your software employs, and to what extent it can control printers, you will need to read the manual that comes with the software. Or, failing that, phone the software house. Or write a letter to *Amiga Shopper* – In that order.

NOT A PRETTY PICTURE

Let's not beat around the bush here, the way printers output graphics is a highly complicated process.

Before printing a line of graphics the printer first needs to be told that some graphics data will be coming and at what resolution that graphics data should be printed. Then it needs to know *exactly* how many bytes of graphics data are coming, and finally, of course, the graphics data must be sent.

The same process has to be carried out for every pass of the print head, or until the whole page has been built-up in its memory in the case of printers that create the whole page before printing it, like laser printers. This is why it takes longer to output graphics dumps than text.

Because of all the different dots-per-inch resolutions in the different types of printers, there are many control codes that tell the printer that graphics data is coming and switch it into the correct resolution.

The printer is much more sensitive to these codes than to control codes that deal with text styles. Often you'll find that an Amiga printer driver will work fine when printing text, but ask it to dump a graphic and you get wonderful flashing lights on the printer control panel, multiple warning beeps, and garbage. Either that or nothing at all and a crash.

The garbage or crash is caused by an incompatibility between the printer driver and the printer. Don't fall into the mistake of blaming the software, the printer driver or the printer. Each of them is doing its job correctly. The software passes the codes and the graphics data to the printer driver; the printer driver sends to the printer the correct control codes for the printer it was written to work with; the printer receives the codes and carries out the actions those control codes mean to it.

SWEET NOTHINGS

A control code that means 'there is graphics data coming' to one printer might mean nothing to another. So it *does* nothing and then treats the following bytes of graphics data as ASCII data, resulting in weird characters all over the place. If the graphics data that is being treated as ASCII data contains the value 27, then the printer will read this as the escape code and the following value as a command. That's why the lights flash and the beeper beeps, because the command to do *those* things is being received.

The answer is to use a correct Amiga driver for your printer. This, as many of you will have discovered, is easier said than done.

THE GREAT PD SCAM

Now, there is a PD program out there called *Printer Driver Generator*. Let me warn you that this piece of software is only slightly more useful for creating printer drivers than a stick of Blackpool rock would be. Despite the assurances you will get from the PD libraries, *Printer Driver Generator* cannot be used to create a proper driver for your printer because it knows nothing at all about graphics. On top of this it only produces Workbench 1.2 compatible drivers. In short, it is useless so please don't waste your money.

There's another PD scam you ought to be warned about, the Printer Driver disks that many libraries advertise. I've seen quite a few of these and they are all 90 per cent full of renamed Extras drivers; in other words they are mostly selling you the Commodore drivers that come on the Extras disk, renaming them (for example) from EpsonX to Citizen_120D or EpsonQ to Star_LC24 and so on and so forth.

Nevertheless, PD libraries (and bulletin boards if you have a modem) are your only source of new printer drivers because none are developed commercially. Why not? Because writing a printer driver is about as interesting as watching grass grow and takes a lot more time, effort and testing than you can imagine. It simply isn't commercially feasible.

AND FINALLY

I'm an avid collector of Amiga printer drivers so it's worth a letter to me at *Amiga Shopper* if you can't find a library with a driver for your printer.

It has been impossible for me to cover every aspect of printers in this article, nor has it been possible to go into any great depth. If enough letters come in, the editor may allow me to expand on this in a future issue. I'd recommend a book for further info-rmation, but I can't because the only one I can find is *Printers Inside and Out* by Abacus, and it isn't very good.

What I *do* recommend is that you get out your printer manual, your Amiga manual with all the ANSI codes in, the manual of the program you are using to print with... and then experiment until your head hurts.

There is no gain without pain. You better believe it! AS

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"Boot disks can often be the source of much aggravation. Here's a simple and effective guide to making them without fuss."

Mark Smiddy

Cracking the Shell

What makes a boot disk bootable? How can Workbench start an application? It's easier than you think. Mark Smiddy tells all...

The bright screen cast eerie shadows across the room. The disk snapped home with a satisfying thunk and the drive spun into action.

"Amiga Workbench Disk release 1.3." Said the screen, "My first Notepad disk."

Then... "Unknown command: NotePad."

The Hacker cursed.

Creating an efficient boot disk is an Orwellian nightmare. But it need not be all that difficult if you follow a few simple guidelines – precisely what this feature is about.

Boot disks come in a variety of flavours. The table shown on page 92 divides this into eight levels of increasing complexity and one glance at it will tell you why things tend to get so apparently tricky. In practice it is rarely necessary to create a boot disk from scratch since you already have one that just needs a few modifications – Workbench!

SIMPLE BOOT DISKS

The most logical way to create a boot disk is to custom build a disk which will automatically start applications from a special Workbench drawer. *Amiga Shopper*'s sister magazine, *Amiga Format* carried one of my special script programs (*MakeAuto*) in issue 20 which was designed for absolute beginners who had yet to master things like DIR and CD. It was less than perfect in some areas and in this feature I will tackle the problem directly.

This example applies to all releases of Workbench from 1.3 onwards. Although the Workbench already has an auto start drawer (WBStartup) it does not work correctly for applications which don't exit quickly. This makes it unsuitable for things like EMacs and IconEd for instance.

1. Boot your Workbench disk, make a copy of the Empty drawer and rename it Auto. (Those users equipped with Workbench 2 should use the New Drawer function to do this.)

2a. If you have Workbench 1.3, open a Shell and enter:

```
1>ED S:Startup-sequence
```

2b. If you have Workbench 2.04, open a Shell and enter:

```
1>ED S:User-Startup
```

3a. Workbench 1.3 users should move the cursor to the line where EndCLI >NIL: appears, press Return to open a blank line and move the cursor into it. Now enter the lines shown in Listing 1.

3b. Workbench 2.04 users have it easier. You might find a message saying "Creating new file". This is quite normal because the user startup is reserved for user functions and prevents you accidentally making a hash of the main Startup-sequence script.

Enter the lines as shown in Listing 2.

4. Now drag one or more applications (tools) to the Auto drawer and reboot the machine. Typical examples are Clock and NotePad (on 1.3).

This patch only works on "tools". If you are unsure what an icon is, select it and choose Info from the menu.

The icon's type must be a tool otherwise it will not work. (The Shell's icon for instance is a Project.)

The advantage of this system is that you can change which items boot automatically on startup by moving them between drawers. The disadvantage is that some programs work differently when started from the CLI and they might not work quite as you expect them to!

HOW IT WORKS: LISTING 1

1. Checks for the Auto drawer required by the patch. If it is missing, execution passes to step 6 and allows the startup to continue as normal. This enables you to modify one Startup-sequence and copy it to different disks without having to create an Auto drawer on every one.

2. This creates a script (T:AutoTemp) using LIST's LFORMAT argument. Typically it will look something like this if the Clock and NotePad tools were placed in the Auto drawer:

```
;SYS:Auto/
Echo "Executing: .info"
RUN <NIL: >NIL: ↵
SYS:Auto/.info
```

continued on page 92

LISTING 1 • LISTING 1 • LISTING 1

The Auto patch for Workbench 1.3

```
1. IF exists SYS:Auto
2. LIST >T:AutoTemp SYS:Auto LFORMAT ";%s*nEcho *"Executing:↵
       %s*" *nRUN <NIL: >NIL: %S%S"
3. ECHO >T:Strip "0(F/.info/;d;)"
4. EDIT T:AutoTemp TO T:RunIt WITH T:Strip ver=nil:
5. RUN >NIL: EXECUTE T:RunIt
6. EndIF
```

BEGINNERS START HERE

What is a boot disk?

Any disk you can use to start the machine after switch on or reset is a boot disk. The most common example is the Workbench disk which boots Workbench. Most games are started automatically from special boot disks.

Why do I need a boot disk?

It is more convenient and cheaper to start a micro from a disk than it is by plugging in a variety of cartridges. Boot disks give developers complete control over the software and hardware with the minimum of fuss and guarantee the environment remains constant.

What is a Startup-sequence?

Essentially it's a simple program (more accurately called a script) built from AmigaDOS commands which tailors the machine to a specific application, say Workbench. The Startup-sequence, which lives in the S (or scripts) directory is always run automatically from a valid AmigaDOS boot disk.

Does every boot disk have a Startup-sequence?

No. Startup-sequence scripts are only found on AmigaDOS boot disks.

Special boot disks used mainly by games also have special 'boot loaders'. These tiny programs are started by the machine automatically and are designed to load and run the main program without needing to resort to AmigaDOS.

Will an AmigaDOS boot disk work without a Startup-sequence?

Yes – after a fashion, but it won't be much use. In practice, all boot disks should have a Startup-sequence.

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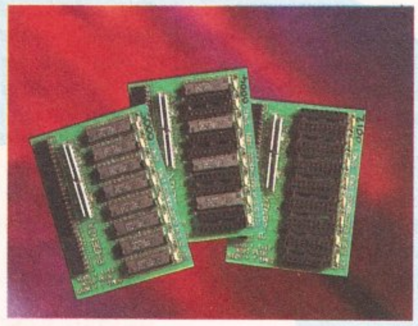
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continued from page 90

```
    ;SYS:Auto/
    Echo "Executing: ↵
Clock.info"
    RUN <NIL: >NIL: ↵
SYS:Auto/Clock.info
    ;SYS:Auto/
    Echo "Executing: ↵
NotePad.info"
    RUN <NIL: >NIL: ↵
SYS:Auto/NotePad.info
    ;SYS:Auto/
    Echo "Executing: Clock"
    RUN <NIL: >NIL: ↵
SYS:Auto/Clock
    ;SYS:Auto/
    Echo "Executing: NotePad"
    RUN <NIL: >NIL: ↵
SYS:Auto/NotePad
```

3. Creates a macro (T:Strip) for the EDIT command. There isn't room here to describe EDIT, but this macro will force EDIT to search for and delete any lines containing the string ".info". Here is how it breaks down:

0(...) – Forces a group of EDIT commands to operate until the input file is exhausted. (Under automatic control EDIT does not display warning condition when this happens).

f/.info/ – Find. Used in this way, EDIT stops at any line containing the string ".info".

;d; – Deletes the current line. Delete is surrounded by semi-colons (;) to separate it from the search string and the closing bracket of the command group.

4. Creates the final script (T:RunIt) by removing any lines containing the substring ".info". The new script will typically look something like this:

```
;SYS:Auto/
;SYS:Auto/
;SYS:Auto/
;SYS:Auto/
Echo "Executing: Clock"
RUN <NIL: >NIL: SYS:Auto/Clock
;SYS:Auto/
Echo "Executing: NotePad"
RUN <NIL: >NIL: ↵
SYS:Auto/NotePad
```

As you can see, this script only attempts to RUN tools. The original MakeAuto program tried to run everything – icons and all, and this slowed things down.

Redirection to and from NIL: (<NIL: >NIL:) is used to stop any tools getting a "lock" on the CLI window, thus allowing it to close.

You should note here that it's quite possible to remove the remarks (;SYS:Auto/) but doing so is rather pointless and would take more time than it would save.

5. Executes the script. The reason for using RUN might not be clear to you, but in some releases EXECUTE complains about the lack of a .KEY statement. This fixes that problem at the expense of an extra [CLI 2] message during startup.

6. The tag for the IF statement in line 1.

HOW IT WORKS: LISTING 2

This works in just the same way as Listing 1, with the exception that the script is created without the dot-info files. This is afforded by the new "~" (NOT) wildcard modifier which stops the dot-info files being included here.

BETTER BOOT DISKS

This system is all fine and nice because it's automatic, but the one big disadvantage is that you have no control over the program's automatic parameters. Many Workbench-based programs support parameters passed in the Tooltypes array and this is completely ignored by the auto system described above.

In order to compensate for this, it is normal practice to support the Tooltypes arguments with similar ones accessible from AmigaDOS. In fact, some programs offer more options from the Shell than they do from Workbench. Whichever way you choose, all auto-starting

continued on page 94

Level	Requires	Notes
1	A valid bootblock	Drops you into an AmigaDOS CLI with the default Preferences (60 columns), blue screen etc). No commands are available unless they are accessed from a different disk (or held in RO<M on AmigaDOS 2.04). Only the ROM resident libraries are available. Keymap setting defaults to US.
2	Level 1+ C directory	AmigaDOS commands are available. Preferences set to ROM defaults. Workbench can be started manually but formatting will not be possible.
3	Level 2+ DEVS directory System-configuration	As level 2, but the preferences settings will be correct.
4	Level 3+ System directory L directory LIBS directory Libraries, handlers, device drivers and system software	Enough to start the machine and use AmigaDOS under CLI. (The Shell cannot be used unless the NEWCON: device is explicitly mounted.) Format and Diskcopy are available. Many applications can be launched manually.
5	Level 4+ DEVS/printers directory printer driver(s)	Printing can now take place from the default printer. (That's the one set in preferences' System-configuration file.)
6	Level 5+ DEVS/keymaps directory keymap file(s)	Keymap can be set manually using SYS:SYSTEM/SETMAP <keymap>. Only applies to new Shell or CLI windows.
7	Level 6+ Prefs directory Preferences tool	The preferences settings can be altered using: SYS:Prefs/Preferences.
8	Level 7+ S directory Startup-sequence	General purpose boot disks start here! Applications can be launched during boot.

LISTING 2 • LISTING 2 • LISTING 2

The Auto patch for Workbench 2.04

```
IF exists SYS:Auto
LIST >T:AutoTemp SYS:Auto/~(#?.info) LFORMAT ";%s*nEcho ↵
*"Executing: %s*" *nRUN <NIL: >NIL: %S%S"
RUN EXECUTE T:AutoTemp
EndIF
```

JARGON BUSTING • JARGON BUSTING

AmigaDOS – The Amiga's disk or device operating system. AmigaDOS the collective term used to describe a set of commands entered by name through a command line interpreter (the CLI) or the Shell – an improved version of the CLI.

NIL – A dummy device. As far as AmigaDOS is concerned, NIL is just another device – a disk drive, printer, whatever; it neither knows nor cares. NIL is all things to all men – it behaves as every command expects it to, but doesn't actually do anything. If a command sends output to it, the output is thrown away; if a command tries to get input from it, it gets nothing. This is much more useful than it sounds.

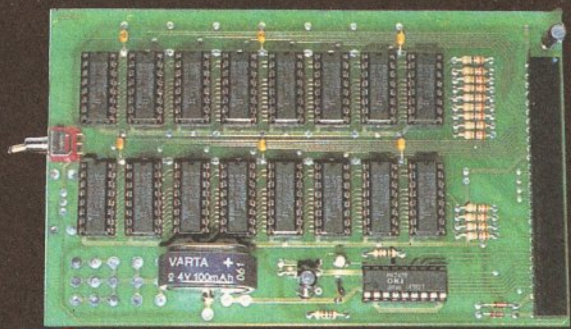
Redirection – The action of sending a command's output (display) or input to another device. Typically redirection will go to files (for creating scripts); to the printer (for printing); or to the NIL: device to prevent them displaying anything. Redirection from NIL: is used to stop some commands holding the initial CLI window open.

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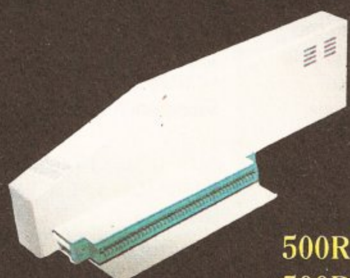
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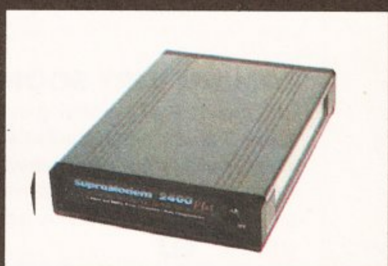
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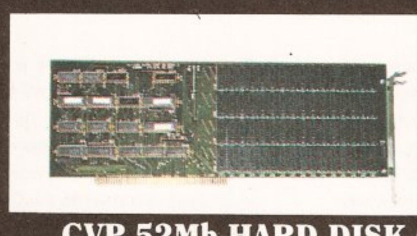
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continued from page 92

Workbench programs must be run from Startup-sequence, so let's examine that first of all.

SYNCHRONOUS COMMANDS

The Startup-sequence is a script which runs in an initial CLI window as the machine boots. This might seem a little obvious, but it is important that you don't freeze the CLI by any action you might take – such as directly launching a program. Try the following (all of the Amiga's responses are shown in bold – you do not need to type these parts).

Open a new Shell and start another new shell like this:

```
1>NEWSHELL
```

In the new Shell window (it's process 2 here) enter:

```
2>Clock
```

When the clock program appears, click in the Shell window again and enter:

```
2>ENDCLI
```

Nothing happens because the Shell is still running the clock program in process slot 1.

You are able to confirm this by returning to the original Shell and entering:

```
1>Status
Process 1: Loaded as
command: Status
Process 2: Loaded as
command: Clock
```

Now stop the clock program (click in its close box) and the second Shell goes away. This is called "synchronous" processing. Only one program is active in a Shell window at any time. This method is not usually suitable for Startup-sequences.

ASYNCHRONOUS COMMANDS

The synchronous method is doomed to failure, so what about Asynchronous commands started using RUN? Let's see.

Make sure you have two Shell windows open and enter the following in one:

```
2>RUN Clock
[CLI 3]
2>ENDCLI
CLI process 2 ending
```

This seems strange. Even though the ENDCLI command has executed the Shell window remains open. It will stay open until you close the CLOCK program.

Although the Amiga is multi-tasking, the CLOCK program has its little claws firmly stuck in the Shell's output handle and isn't about to let go. Check this with STATUS:

```
1>Status
Process 1: Loaded as
command: Status
Process 3: Loaded as
command: Clock
```

Do you notice ttat there is no sign of CLI process 2 any more? Even so, its window remains open. This is a deliberate feature of asynchronous processing because it enables run-launched commands (CLOCK in this case) to display output in a CLI window if they need be. Note that this technique is not suitable for Startup-sequences because the CLI window will not close at the end of the script.

Now we get to the good bit. A modified version of the command given to start an asynchronous process can be used to produce a complete background process. As it happens this is just the effect we require.

As before, start a couple of Shells and enter this in the second:

```
2>RUN >NIL: Clock
2>ENDCLI
CLI process 2 ending
```

This time, the second Shell window does disappear – even though the clock program is running – and you don't need STATUS to tell you that. However, you should notice the [CLI nn] message does not appear.

You can check which slot CLOCK is running in and confirm CLI slot 2 is free like this:

```
1>Status
Process 1: Loaded as
command: Status
Process 3: Loaded as
command: Clock
```

This technique will be suitable for most programs and can in fact be used to launch just about anything in the background during startup, and the CLI window will close correctly too.

It should be noted that very few programs (and my own *Sleepy* is a prime culprit) will stolidly hang on to the input handle even if they don't need it. This can be fixed by adding input redirection from NIL: like this:

```
2>RUN <NIL: >NIL: ↲
Sleepy eggy1 eggy2
```

This technique is used in the Simple boot disk example above to make sure that the initial CLI window always closes.

You should use this with some care because a few compiled programs try to write to the NIL: device and cause the machine to visit the guru land.

SMIDDY'S RED HOT TIP

Editing your Startup-sequence can be a real chore because every time you want to make a change you have to enter:

```
1>ED S:Startup-sequence
```

or, if you are editing from another disk, say drive 0:

```
1>ED DF0:S/Startup-sequence
```

This is very prone to typing errors, so here are a couple of ALIASes to add to your Shell-Startup file:

```
ALIAS EDS ED S:Startup-sequence
ALIAS EDX ED DF[]:S/Startup-sequence
```

To edit the current Startup-sequence (the one of the disk you have most recently booted from, just enter:

```
1>EDS
```

or, .to edit the Startup-sequence on the disk in DF0: (say) enter this instead:

```
1>EDX 0
```

You only have to enter the number of the drives you want to access – the alias does the rest. Easy huh?

WATCH MY BACK

Using NIL in this way gives rise to a useful little ALIAS. Called BAK, this simple command adds functionality to all machines because it allows you to run any command completely in the background and prevent it getting locks on your Shell windows. Add this to your Shell-startup file:

```
ALIAS BAK RUN <NIL: >NIL:
```

Once defined the new alias is a breeze to use, you just enter it instead of RUN, viz:

```
1>BAK Clock
```

YOUR TIME'S UP

All this theory and experiment is no good without a good solid practical example, so here's one. In the simple example outlined at the beginning of this feature I suggested using the Clock in the Auto folder. However, this only brings up an analogue clock which isn't really much use for general purpose Workbench disks. Having the time tucked away at the top of the Workbench might be though.

To achieve this, just add this line to your Startup-sequence between LOADWB and ENDCLI, or to the end of User-startup if you are using Workbench 2.04:

```
RUN <NIL: >NIL: CLOCK ↲
DIGITAL2=300,0 24Hour ↲
Seconds
```

If you are feeling particularly frivolous, you might want to try it this way instead:

```
RUN <NIL: >NIL: CLOCK ↲
ANALOG=0,0,640,256 Seconds
```

COMING VERY SOON

Next month, I will be delving even deeper into the actual contents of a boot disk and taking you step-by-step through the commands which are necessary to create one from scratch. AS

GOTTA PROBLEM?

If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, Amiga Shopper, 30 Monmouth St, Bath BA1 2BW.

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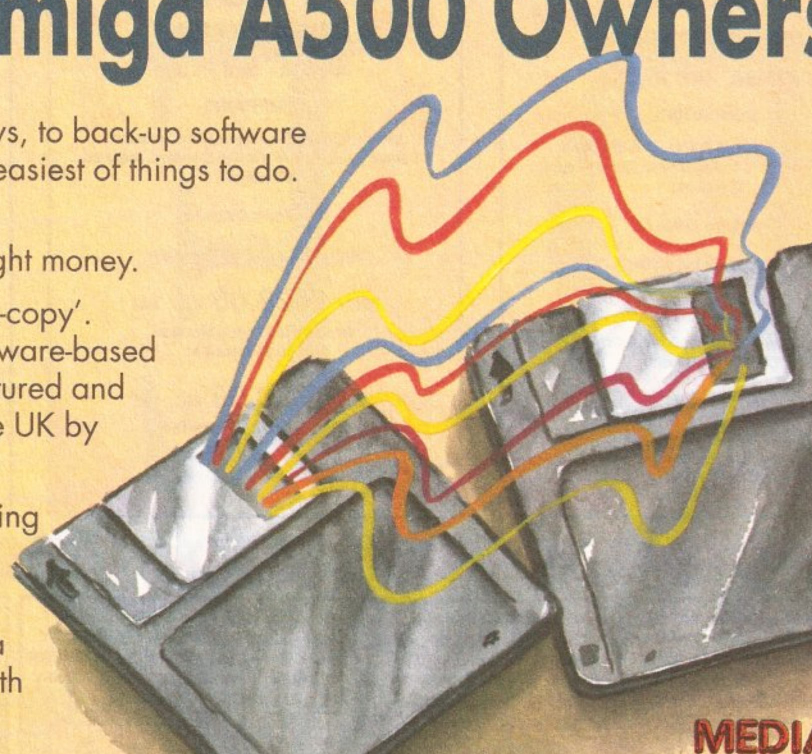
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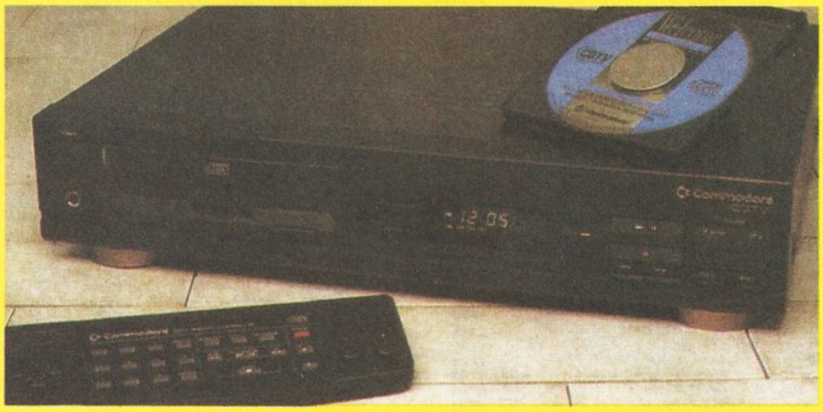
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CDTV is the same size and style as most video recorders, so it can sit unobtrusively above or below your home TV and/or HiFi. With its infrared controller it can be operated from your armchair. But, perhaps more importantly, if you are a computer enthusiast, remember that inside every CDTV there is an AMIGA just waiting to be used. So Later on you'll be able to buy the optional keyboard and disk drive to get you into the world of AMIGA computing. Printers, digitisers, genlocks and other accessories can all be connected to give access to many other exciting facilities and also many of the existing software packages available for the AMIGA computer. Never before has there been so much potential from one stunning system, packed with today's technology.

Call in to your nearest branch and have a personal demonstration, or phone for your fully detailed CDTV information pack.

CDTV ACCESSORIES

Due to be released soon
Please call for availability.

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CD1400	**Caddy** For holding CD within drive	£9.95
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CD1301	**Genlock** PAL based video interface card for superimposing CDTV images over a video signal provided by any PAL standard video source.	£149.95
CD1321	**Video Card** PAL based video interface card to allow connection to TV's, videos etc requiring UHF, SVHS or composite inputs.	P.O.A.
Matching External Disk Drive		£64.95

Many AMIGA accessories and peripherals (printers, disk drives, software etc) are compatible with CDTV.
Please phone for information.

MULTIMEDIA IN YOUR OWN HOME

CDTV brings information and entertainment into your home in a way that has never been possible before. It is based around the familiar compact disc player combined with a computer which simply connects to your television and combines still and moving pictures with sound and thus offers a whole new world of possibility.

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68000 Assembly Language

Our language column digs down even deeper as Paul Overaa has a look at assembly language and the Motorola 68000...



"Assembly language is the best way to really get to grips with your Amiga – I'm here to tell you what it's all about.'"
Paul Overaa

This month we take a look at assembly language – the programming language which is understood by the central processing unit and to which all other programs must be translated.

At the heart of any computer system is the processor. This will have registers for storing data, some hardware-oriented means of communicating with the outside world, and it will have its own 'instruction set', ie a collection of logic/arithmetic instructions which cause it to perform various tasks. The 'language' that the processor understands is based on binary numbers. Given suitable hardware (a processor chip, memory, some input/output facilities, and all the associated electronic support) one way of programming such a system would be to enter suitable binary numbers directly into system memory and then get the microprocessor to execute the instructions.

This approach was actually used to create and run programs in the early days of computing. It didn't take long before programmers realised that this sort of programming was a pain because the numbers which related to particular processor instructions didn't have any obvious connection with what the programmer was really trying to do. The solution was to give the instructions meaningful names (or as meaningful as possible) eg ADD, MOVE, SUB and so on. These humanized instruction names were called mnemonics because they were a memory aid which helped programmers to remember the purpose of the underlying processor instructions. The next step was to automate the process of converting mnemonics back to the numbers which represented the processor instructions. Programs which did this translation effectively 'assembled' the runable program from the mnemonic instructions that the programmer had provided so they were called assemblers. And so, the assembly language was born!

Over the years, processors, assembly language programming concepts, and development software have all become increasingly sophisticated but these assembly languages (and each processor has its own) are always close to the actual machine and its underlying hardware – hence they are called low-level languages. The Amiga, as you'll already know, uses a microprocessor called the Motorola 68000 so to program at this level you need to learn 68000 assembly language!

THE MOTOROLA 68000

The 68000 is a processor which has eight 32-bit data registers, seven 32-bit address registers, two 32-bit stack pointer registers, and a 32-bit program counter. There is also a 16-bit status register (divided into two eight bit registers) – these contain flag bits (the values of which are set and cleared according to particular results and processor operations), and a number of other mask/mode bits.

Five flags are available including ones for carry and overflow detection, and zero condition testing. If, for example, the result of some arithmetic operation was zero then the 68000's zero flag would be set. By convention the data registers are labelled d0-d7, the address registers A0-A6, and the combined twin stack pointer register A7. Even though the 68000 is a 16-bit processor the internal registers are 32 bits wide and many instructions can in fact work with bytes (8 bit), words (16 bit) or long word (32 bit) values. The assembly language programmer identifies these variants by placing .b, .w or .l after instructions.

The 68000 instruction set is large and almost all sensible addressing modes can be used with any instruction. There's no way we can talk about, or even just list, each instruction – so here is a very brief outline of the type of things the 68000 can do:

DATA MOVEMENT

The 68000 has a large number of instructions which allow the transfer of data to and from memory and/or the 68000 microprocessor's internal registers. Eg the instruction...

```
move.b d0, d1
```

transfers the lower eight bits of data from register d0 to register d1. This is an example of register addressing. On the other hand...

```
move.l #0, d1
```

places a zero value in register d1. The hash # sign indicates an operand source addressing mode known as 'immediate' addressing – in terms of the final 68000 instruction this means that the operand (in this case a 32-bit zero value) is stored immediately after the move.l instruction code.

Data can also be moved to memory locations, so to move the full 32-bit contents of register d0 to

Addressing modes

One of the most powerful features of the 68000 instruction set is the rich variety of addressing modes available. Most processor instructions work on a piece of data (the operand). This data has to be stored somewhere. Many instructions will use some real or implied source address, do something, and then transfer the result to its destination address – the processor's addressing modes enable these source and destination addresses to be specified. With the 68000 there are eleven basic addressing schemes and for completeness here are their names:

- **Inherent**
- **Register**
- **Immediate**
- **Absolute**
- **Address register indirect**
- **Address register indirect with displacement**
- **Address register indirect with postincrement**
- **Address register indirect with predecrement**
- **Address register indirect with index and displacement**
- **Program counter relative with displacement**
- **Program counter relative with index and displacement**

Inherent addressing means that the instruction itself implies the location of the operand. Register addressing implies that the operand resides in one of the 68000's internal registers.

Absolute addressing means that the ADDRESS of the operand is located just after the instruction in memory, whereas immediate addressing implies that the operand itself is located just after the instruction in memory.

Indirect addressing is a very powerful concept and on the 68000 a variant called register indirect addressing is used. In short, an address register is used to specify the ADDRESS of the operand. In addition to these straightforward addressing modes it is possible to specify displacements, to auto-increment or auto-decrement an address by 1,2, or 4 bytes (this comes in handy for stepping through lists of 1,2 and 4 byte data items) and to write program counter relative code (which is necessary when writing truly relocatable code).

It's not possible to explain all of these addressing modes (proper explanations would take an article in itself) but you'll find a couple of addressing mode notes elsewhere in this article.

a memory location which has been given the symbolic name _DOSBase you would use this instruction:

```
move.l d0, _DOSBas
```

ARITHMETIC AND LOGIC INSTRUCTIONS

The 68000 supports a standard set of logic and arithmetic operations which allow it to perform addition, subtraction, multiplication and division. In addition to this it also supports all of the common logic operations (AND, OR, XOR etc.) As an example, the instruction:

```
add.l d0, d1
```

adds the full (32 bit) contents of data register d0 to the contents of register d1.

FLOW CONTROL

Without flow control instructions a processor would only be able to execute program instructions sequentially. The ability to execute different parts of a program under different input/data conditions is fundamental to the nature of computing so the 68000, like all other processors, provides a number of useful mechanisms.

The 68000 provides both conditional and unconditional branch/jump type instructions for transferring control from one part of a program to another. One such instruction is called beq (Branch on EQual to zero) and this is a flow control branch which is only taken IF the 68000's zero flag is set. To use this instruction to conditionally branch to a symbolic address called EXIT you would write:

```
beq EXIT
```

Unconditional branch/jump instructions are also available and I'm always reminded, when I discuss this particular area, about Basic's goto instruction. This got the blame for helping programmers to produce tangled web, spaghetti type, programs which no-one could understand, debug or alter. Goto is now defunct within the world of high-level languages, discredited and largely unused. Any competent programmer, however, will tell you that gotos *can* be used properly and can result in tidy well structured programs. The difficulty is of course that it is only too easy to use the goto statement in an undisciplined way... and it's that which leads to program structure problems.

THE GOTO INSTRUCTION

Why have I mentioned the goto at this time? It's because it has a strong connection with the branch and jump instructions of the 68000 processor. Programming at low-level then has all the disadvantages, yet none of the advantages, of the primitive high-level language facilities which have long since been superseded by forms which encourage the programmer to produce, or at least facilitiate the production of, tidier programs.When you program using 68000 assembly language, or any assembly language, you'll find no such encouragement. To a large extent any structure and tidiness in the code will have to come from you the programmer.

Subroutine oriented branch and jump instructions are also available on the 68000 and these automatically store a 'return' address on the stack (after a subroutine call has been executed this return address is used to transfer control back to the main part of the program).

OTHER INSTRUCTIONS

Instructions are provided which allow the 68000 to test, set, and clear individual bits and to rotate and shift operands. There are powerful address calculation instructions, automated loop instructions, and even instructions which allow data areas to be allocated within stack space as subroutine calls are made. A variety of instructions are also available for comparing particular operand values (these set the appropriate status register flags).

There is of course a lot more to 68000 assembler programming than we've been able to cover in this article, but hopefully the general flavour of this style of low-level language programming will have become apparent. The instruction sets of most processors, even powerful ones like the 68000 used in the Amiga, are then quite limited and there is nothing complex about their operations. Each instruction carries out some elementary task, perhaps adding two values together or copying the contents of one memory location to another.

Despite this underlying simplicity there's no doubt that tackling 68000 assembly language is not a task to be undertaken lightly. Problems will arise when you try to work out how to combine thousands of assembly language instructions into a program which does a particular job. It is a task which is error prone and time consuming. The benefits? Firstly you'll be able to make your programs run at the ultimate speed. Secondly, you will develop a 'gut feeling' for what computing is all about at the 'nuts and bolts' level.

LAST WORDS

Assembly language programming on the Amiga adds another dimension – the complexity of the operating system itself. Before you can comfortably write assembler code to do a job you need to know enough about the operating system and its library code system call arrangements to work out what your assembler code should be doing.

Don't forget that it is often possible to combine high-level and low-level approaches. Here the bulk of the code is written as normal using a high-level language, and any routines which are critical are added as assembler patches. This gives the programmer the best of both worlds – high-level development coupled with absolute speed and control in the sections where it counts! AS

A Short Example

For reasons of space it's not possible to give a fully fledged 68000 Amiga program but this example, though useless in terms of what it does, should give you an idea of what 68000 programming is all about. First of all here is the piece of code itself:

```
OPEN_DOS:
   move.l #dos_name,a1  ↵
load pointer to library name
   move.l #0,d0  place ↵
library version in d0
   CALLEXEC OpenLibrary ↵
this is an Amiga system ↵
macro
   move.l d0, _DOSBase  ↵
save the returned pointer
   beq EXIT      test to ↵
see if it is non-zero
   CALLEXEC CloseLibrary↵
only close if OpenLibrary ↵
was OK
EXIT:     rts    logical ↵
end of program
_DOSBASE ds.l 1
dos_name dc.b ↵
'dos.library',NULL
```

An assembly language program consists, in the main, of statements which can contain up to four fields... a label, a mnemonic code, operands/addresses, and comments.

Labels are used to identify particular places in the program (ie they provide symbolic names which make the program more readable), the mnemonic codes and operands/addresses fields are the instructions we've talked about and the comments are used to provide in-line program documentation.

Most of the instructions in the above example program have already been explained. The first statement, for instance, loads register a1 with the start address of the DOS library name (this name has been stored as part of the program's static data by using an assembler directive called dc.b (define byte constants).

The next instruction places a zero in register d0. Why is this done? It's an Amiga system convention – we are using an Exec system call named OpenLibrary and this function (which is documented in the Amiga RKM manuals) requires the start of the library name (ie the address of its first byte) to be in register a1 and the version number to be in register d0!

The third program line, CALLEXEC OpenLibrary, is *not* a 68000 instruction – it is an assembler pseudo-instruction which identifies a group of instructions (called a 'macro'). In this particular example the real instructions are defined in the Amiga header files and the assembler inserts the appropriate instructions automatically.

The OpenLibrary system call, like a great many Amiga system calls, may not succeed so when the program runs two possibilities present themselves:

1: The OpenLibrary call succeeds – in which case register d0 will contain a valid 'base address' for the library (this return value again stems from RKM documented system conventions).

2: The OpenLibrary call fails – here system conventions dictate that on return from such a call d0 will contain a zero failure indicator.

The program must take account of these eventualities which is what the example program does: the program stores, using a move.l instruction, the contents of d0 in a memory location which has been given the symbolic name _DOSBase. As the data is moved the zero flag is modified to reflect the value of the data item – a beq (Branch on EQual to zero) instruction is then used to decide whether or not the library was successfully opened. The result of this branch based jiggery-pokery is that the library is closed ONLY IF the library was successfully opened in the first place. The last program statement, an rts instruction, is the 68000's return-from-subroutine statement – in this case is being used to signify the end of the program.

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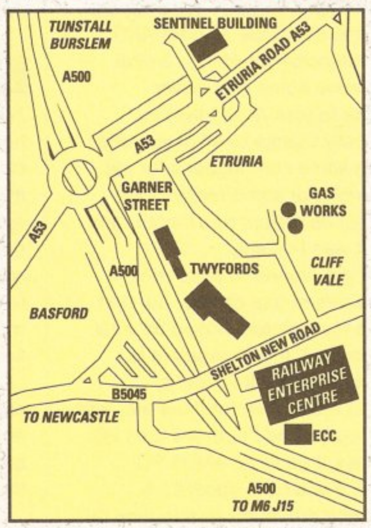
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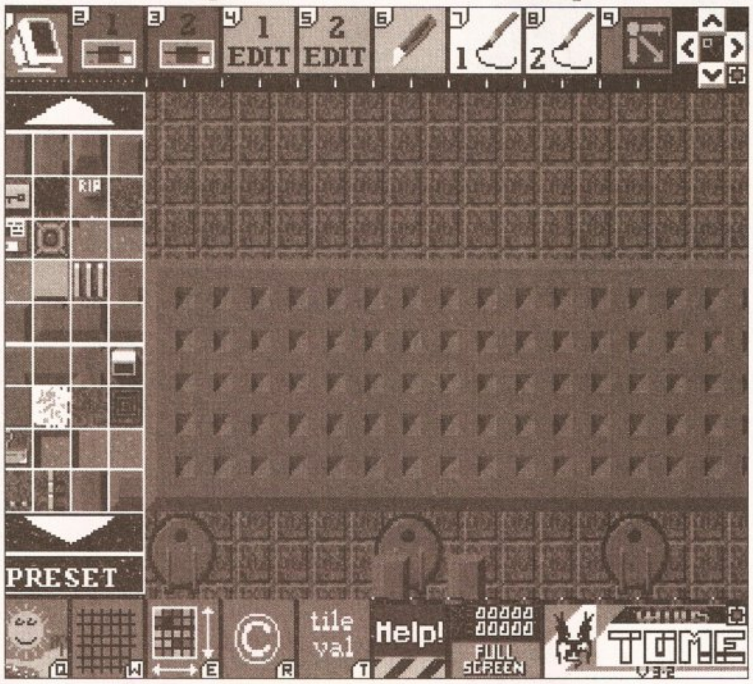
This month AMOS chief Phil South looks into AMOS TOME, the Oasis NCOMMAND extension disk, plus all the regular hints and tips



"Welcome to the AMOS column, the place where every month you can find tutorials and lots of hints and tips for use with Mandarin Software's AMOS BASIC interpreter."
Phil South

A lot has been happening this month, not least of which was a call from Aaron Fothergill, organiser of the AMOS Club and writer of *SpriteX*, *CTEXT* and *AMOS TOME*. Many thanks to Aaron for sending me a copy of *AMOS TOME* which I'm about to review. Thanks also to Oasis Software for dropping me a line about the *NCOMMAND* 2.02 extension for AMOS, a disk which adds some very clever routines to your AMOS system. And finally thanks to all of you who sent in some contributions for me to look at. For some reason I got an absolute *torrent* this month, and all of it was brilliant.

I'll get around to answering your letters in due course, but first of all a few pointers based on what I've received. If your program is good, but large, I'll review it, suggest alternative routines etc, and if it's really good I'll review it as PD and pass it on to an AMOS PD Library. If you have supplied a short program, such as a routine or PROC which could be used by anyone, I'll probably print it as a tip. But in all cases I would like the following: a disk with the program on, preferably with an uncompiled version of your AMOS code on it, a listing on paper, and return postage in the form of a first class stamped addressed jiffy bag just big enough for a disk. So there you are, that's how you can get your stuff looked at.



With TOME you save time and memory when creating mapped games. The program works like a collage; simply paste together your building blocks...

AMOS TOME

TOME is something that's much heard of and rarely seen in AMOS circles, and this is mainly because it's a super extension to the AMOS system which enables you to create mapped games with ease. In fact anything which would require screens to be linked in a certain order can be more easily carried out with *TOME* installed.

TOME began life as a small utility program on the Atari ST (spit!) which enabled the user to produce game backgrounds which were much larger than the actual physical screen.

Over the last few years the product has been improved, until, when AMOS was finished, an Amiga version of *TOME* was created. AMOS *Total Map Editor* is the ultimate MAP designer for use not just with AMOS but with any language on any computer!

The program takes the form of the *TOME Editor*, where all your bits of map are patched together and saved as a file, and the *TOME* extension, which is added to the AMOS system to do various map type commands for you.

The version I got to review is the newest AMOS 1.3 or Compiler compatible version called *TOME 3.2*, which has recently been supplied free to all previously registered AMOS *TOME* users, and is included in all new AMOS *TOME* packages. (Note: If you're still using AMOS 1.23, then I would advise you to upgrade to AMOS 1.32 right now!)

WHY USE TOME?

The reason for using *TOME* is that it enables you to create giant screens in memory using a series of simple building blocks, these areas of memory are called MAPs – for obvious reasons.

You can design a giant MAP the height of many screens and it will not take up nearly as much memory as drawing a picture that big.

TOME works a little bit like a jigsaw or collage in that you first create building blocks called Tiles, you then use the editor to paste these building blocks on to your MAP area thus creating a giant picture.

Tiles are simply square blocks of a picture, cut out using the utility supplied with *TOME*. This utility cuts up a picture into 16*16 or 32*32 pixel blocks and stores them as AMOS Icons in an AMOS Icon bank.

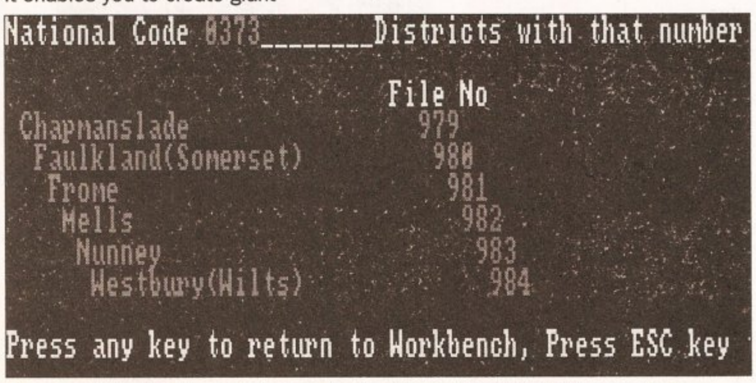
Tiles are created by drawing them on an IFF screen, starting from the Top Left (Tile number 0) and working right, then going to the next line, working right and so on. You then load up the TileMaker program, which converts the picture into AMOS Icons. AMOS Icons are areas of a screen which can be cut out and saved inside a safe area of memory ready for later use. They can be thought of as less flexible versions of AMOS BOBs.

The practical use of *TOME* can be seen in many different commercial games which have large scrolling areas, *Ghouls'N'Ghosts* by US GOLD and *Rainbow Islands* by OCEAN/GRAFTGOLD are two good recent examples.

INSTALLING TOME

Before you can use the *TOME* commands, or any of the programs on the *TOME* disk, you need to install the *TOME* extension on

continued on page 112



If you need to locate calls you've made, when all you have is a number, *Natcodes* is what you need. See Amos Hints and Tips for more details

AMOS HINTS AND TIPS • AMOS HINTS AND TIPS

Every month I will be printing AMOS hints and programs from my own sources and from you the readers. If you have any hints and tips you want to send me (preferably accompanied by your listing on a disk), send them to: Phil South, AMOS Action, Amiga Shopper, 30 Monmouth Street, Bath, Avon, BA1 2BW. Or you can e-mail me on:
CIX – snouty@cix.compulink.co.uk
Telecom Gold – 74:MIK2077
The Direct Connection – uad1135@dircon.UUCP

Tony Ashton has come up with the ultimate solution to sprite positioning. I'll let Tony tell the story:

"I often find that I need a bob or sprite to appear at a specific location. Also since I sometimes need to flash or change colours, I need to know which colour is at which location in my palette. For this reason I wrote the enclosed tool, which loads up the background scene, and picks up your bob/sprite so that you can position it exactly on the screen while showing the hardware co-ords. Click the sprite in place, and it gives you the screen co-ords. Now you can use the two menus to select the screen and sprite palettes. Highlight the colour you want to alter and the program prints the hex number of the colour to the screen. Now you have a record of all you need. To change the sprite you position, simply alter the sprite number in the XMouse/YMouse Do Loop."

A neat and quick programming util, which you could program as an accessory. What about writing a way of saving the data in a meaningful form to a file or the printer? Any ideas how that could be done? Thanks anyway to Tony. This is an excellent example of the programs I like to see: short, neatly and logically written, and useful too.

X Sprite – Y Sprite by Tony Ashton

```
'
' Converts Sprite Co-ords to Screen ↵
Co-ords
' Shows Sprite Register
' Position sprite - click mouse - ↵
shows screen co-ords
' Menu shows colour chart & Hex no.↵
(excl. colour 0 (black))
' Select Hex no. - click left mouse ↵
- Hex no. printed to screen
' Move colour charts to convenient ↵
position by "picking up" with left
' mouse.
' Change to required sprite in X ↵
Mouse,Y Mouse loop
'
Cls
Erase 1
F$=Fsel$("DF0:",""," Load Background ↵
Picture ")
If F$="" Then Edit
Load Iff F$,0
'
SPR$=Fsel$("*.Abk",""," Load Related ↵
Sprite Bank ")
If SPR$="" Then Edit
Load SPR$,0
Get Sprite Palette
Curs Off : Paper 22 : Pen 15 : Rem - ↵
or whatever !
'
Locate 0,0 : Print " X Hard is  ";
Locate 0,1 : Print " Y Hard is  ";
'
Do
Sprite 9,X Mouse,Y Mouse,1
Locate 20,0 : Print X Sprite(9);"    ";
Locate 20,1 : Print Y Sprite(9);"    ";
If Mouse Key=1 Then Goto LABEL
Loop
'
LABEL:
Locate 28,4 : Print "Sprite";
Locate 28,5 : Print "Register";
For C=16 To 31
Locate 28,C-9
Print Hex$(Colour(C),3)
Next C
'
Locate 0,4 : Print "Screen";
Locate 0,5 : Print "Register";
Locate 0,7
For C=1 To 15
Print Hex$(Colour(C),3)
Next C
'
Locate 0,0 : Print " X Screen is  ";
Locate 0,1 : Print " Y Screen is  ";
'
Locate 25,0 : Print X Screen(1);"  ";
Locate 25,1 : Print Y Screen(1);"  ";
'
Menu$(1)="    0 to 15 "
Menu$(2)="               16 to 31 "
'
For D=1 To 15
   Menu$(1,D)="(IN 1,"+Str$(D)-""+")↵
              (BA 30,12)"
Menu$(1,D,1)=Hex$(Colour(D),3)
Next D
For C=16 To 31
Menu$(2,C)="(IN 1,"+Str$(C)-""+")↵
(BA 30,12)"
Menu$(2,C,1)=Hex$(Colour(C),3)
Next C
Menu On
Do
If Choice
Locate 28,25 : Pen 24 : Inverse On : ↵
Print Hex$(Colour(Choice(2)),3)
End If
Loop
```

Tony's excellent program gave me an idea, and I whipped up this little program to show up mouse co-ords. I know the thing which flummoxed me about limiting and reading the mouse over certain points on the screen was positioning. And this program enables you to do this very accurately. Load an IFF picture, preferably the one you want to locate the mouse over, and then just read the figures (and write them down) as you move the mouse over the screen.

Mouse locutor

```
'A program to show the location of ↵
the mouse on screen, for positioning ↵
over an IFF fileof your choice...
'
Paper 0 : Clw
Curs Off
F$=Fsel$("*.IFF",""," Load Background ↵
IFF Pic ")
If F$="" Then Edit
Load Iff F$,0
Locate 0,0
Print "Snout's Mouse Co-ord Engine"
Locate 0,1 : Print "X=    " : Print ↵
"Y=   "
Locate 0,20 : Print "CTRL-C to stop"
Do
   Y1=Y Mouse
   X1=X Mouse
   Y1$=Str$(Y1) : X1$=Str$(X1)
   Locate 6-Len(X1$),1 : Print X1 :↵
Locate 6-Len(Y1$),2 : Print Y1
Loop
```

And finally from Graham Jones, a replacement for the Sort routine on page 59 of the AMOS manual. Graham invented this routine as part of an excellent program he wrote called *Natcodes*, which will soon be appearing as licenseware. This program takes the STD codes for different parts of the country and tells you where that place is. The phone book tells you the place and then the number. This way you can type in a code you've dialled and find out where it was you were calling.

'Stringsort' by GH Jones

```
'
Screen Open 0,640,256,4,Hires
'
Paper 0 : Clws
Locate 0,0
Print "This routine replaces that ↵
given in the "
Print "AMOS manual for the Sort ↵
command."
Print "It can also be modified to ↵
use variables."
Print
Print "<Press a key>" : Wait Key : Cls
'
Input "Enter max No. of Array values ↵
";N
Print : Inc N
Dim A$(N)
P=1
Repeat
    Input "Enter string ↵
(Null to stop) ";A$(P)
   Inc P
Until A$(P-1)="" or P=N
Sort A$(0)
For I=N-(P-2) To N
   C=I-(N-P+1)
   A$(C)=A$(I)
   A$(I)=""
Next I
Cls
Print "Sorted array in ascending ↵
order." : Print
For J=1 To N
   Print A$(J)
Next J
Wait Key
```

continued from page 110

to your copy of AMOS. Once the extension is installed into AMOS, you can use the AMOS *TOME* commands within your programs or even in direct mode, as they become part of the AMOS Language. Installing *TOME 3.2* is a little more taxing than previous versions as you have to bolt on the thing manually rather than just running a neat install program. This is no real problem though.

To install the *TOME* tools, just load the TOME_INSTALL.AMOS program into your AMOS 1.3 and run it. Then all you need to do is to select which version of AMOS it is that you wish to install the extension on to. The program will then look for a disk called AMOS: (if you have ASSIGNed this on your hard drive it will also work) and save a program called TOME.Lib into your AMOS_SYSTEM directory. Once this is done, you can quit the TOME_INSTALL program.

The next step is to load in the AMOS configuration program. In 1.3 of AMOS it's called CONFIG1_3.AMOS. Next you will have to load the default configuration.

After carrying out the above steps you have to select the LOADED EXTENSIONS item. This will give you a listing of all the extensions that have been installed into AMOS. You will probably have something like the following:

1:AMOS_SYSTEM/Music.Lib
2:AMOS_SYSTEM/Compact.Lib
3:AMOS_SYSTEM/Requester.Lib
4:
5:AMOS_SYSTEM/Compiler.Lib
6:AMOS_SYSTEM/Serial.Lib
7:
8:AMOS_SYSTEM/CTEXT.Lib
9:AMOS_SYSTEM/Range.Lib

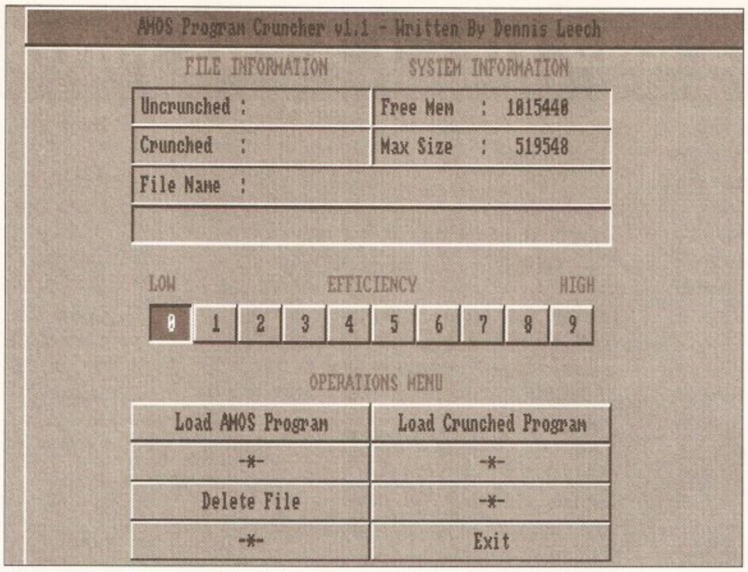
next you have to click on the blank Line 7 and enter:

```
AMOS_SYSTEM/TOME.Lib
```

then save that configuration as the default. Now when you reboot your AMOS, it should load up with the TOME extension installed, ie it will show up on the list of loaded extensions when AMOS starts.

DOCUMENTATION

The docs to the *TOME* program are featured on the *TOME* disk as a home built hypertext program. You can click on various text screens and get info about the program, roaming around the text for the manual in an interactive way. I must admit this is quite impressive, but I still prefer paper manuals. All the same the information in the *TOME* hypertext manual was easy to obtain and fast



***NCOMMAND* in action. It adds all the usual characterisitics of Workbench 2. Check boxes, number requesters and text lines all feature**

too. Not bad for an AMOS program, eh?

THE TOME EDITOR

The *TOME* editor enables you to create, edit and save all of your game Maps. It is a powerful map editing system which includes simple drawing facilities similar to those found in *Deluxe Paint*, therefore, to get the most out of the system, you must have at least 1Mb of memory.

When you load the editor you see that the screen is divided into four main parts. The first two are Icon bars which run along the top and bottom of the screen and control all of TOME editor's functions. Each bar is divided into a number of small Icons, and as you click on an Icon on the top bar a new selection of options appear on the bottom bar.

The next part of the screen at the far left is the tile selector and contains copies of all the Tiles you created with a paint program and TileMaker. The scroll arrows at the top and bottom of this area allow you to move through a selection of your Tiles. You can also click on the right hand button while positioned over the map to select a tile. At the bottom of this part of the screen is an Icon with the word PRESET on it. If you click on this you will see the current range of TILEs replaced with another set, a user defined set.

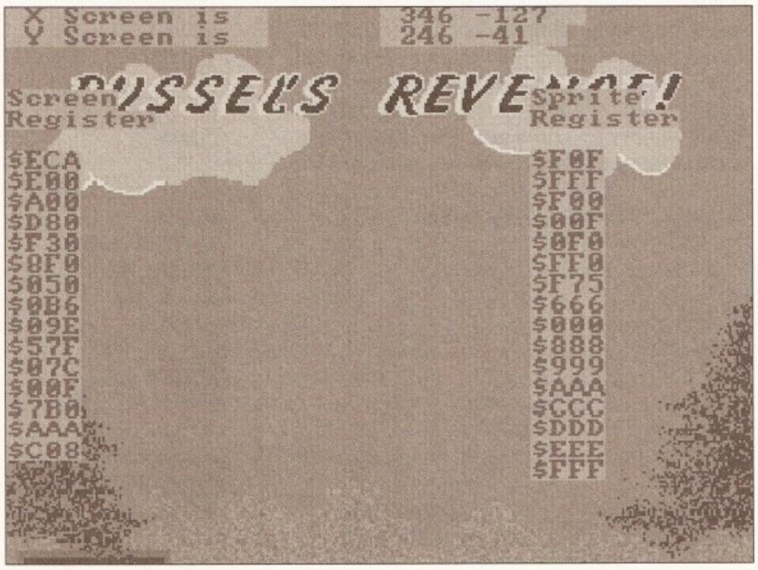
The last bit of the screen is of course the Map itself. This is a large area just off centre and to the right of the screen. To move around the MAP you can use the joystick, cursor keys or the little arrows in the far right corner of the top Icon bar.

NICENESS...

Isn't this an Edna Everage song? Sadly no, it's the configure *TOME* editor menu. The Niceness menu option enables you to configure the editor to suit your own tastes.

The different options displayed on the menu enable you to change the screen from PAL to NTSC, switch on the cursor co-ordinates, adjust the Tile/Icon bar palettes, save the settings exactly how you want them and even return everything back to their default states, the usual config fare.

The palette controls are the same as in the AMOS Sprite editor (and *SpriteX*), and enable you to set either the colours of the control icons or the tiles (to your own preference). Simply click on the colours you want to change, and use the sliders to set the RGB values.



The Niceness menu of TOME enables you to adapt the editor to your own taste. The palette controls are similar to those of *SpriteX* (seen above)

AUTO MODES

There are a couple of automatic modes you should know about. First is Maze Mode. By using this and selecting Tiles for corners and junctions etc, *TOME* will follow your mouse movements and will create instant mazes as you draw. This is a really good feature, but Auto Map is even better. Whereas Maze Mode will follow your mouse movements to produce a maze of your own design, this mode goes a step further and does all the work for you. This mode can take a while especially when used on large Maps.

THE TOME COMMANDS

The actual *TOME* extension only works from within AMOS and on files created with the *TOME* Editor. Here are some of the commands you can use from within AMOS:

```
MAP DO x,y
```

Redraws the map starting from map co-ordinates "x,y" to the current screen. It's suggested by the manual that you draw your maps to a single buffered screen and SCREEN COPY them to a double buffered screen, as drawing icons to a double buffered screen is very slow.

```
MAP TOP x,y
MAP BOTTOM x,y
MAP LEFT x,y
MAP RIGHT x,y
```

These four commands are exactly the same as the MAP DO command, except that they only redraw one edge of the display area. This is very handy for fast scrolling.

```
MAP VIEW x1,y1 to x2,y2
```

This command creates a window to which TOME will limit all of the MAP drawing functions. Obviously the window cannot be any bigger than the currently defined screen.

```
TILE SIZE x,y
```

This sets the size of the tiles to be used. Normally X & Y will be either

16 or 32, but smaller sizes can be used.

```
MAP PLOT t,x,y
```

Places tile "t" at co-ordinates x,y in the map. The same as using the DRAW function within the TOME Editor.

```
tx=MAP X
```

Returns the width of the current map in TILEs. The width is passed back into variable "tx".

```
ty=MAP Y
```

Returns the height of the current map in TILEs. The height is passed back into variable "ty".

```
xt=XTILE(x)
```

Changes pixel co-ordinate "x" into a TILE co-ordinate. The co-ordinate is passed back into variable "xt".

```
yt=YTILE(y)
```

Changes pixel co-ordinate "y" on to a TILE co-ordinate. The co-ordinate is passed back into variable "yt".

```
tn=MAP ↲
TILE(x,y)
```

Returns the tile number as found at MAP co-ordinates "x,y" into variable "tn".

```
=TILE VAL(x,y,l)
```

Returns the value from list "l" of the tile at MAP co-ordinates "x,y".

```
MAP BANK b
```

Changes the bank used for map storage to bank b.

Normally, the default is bank 6, which you should reserve to the length of the map, and then load the map in. e.g

```
Rem this finds the length of↲
the map
Open in 1,"Mymap.map"
L=Lof(1)
Close 1
Rem This loads the map
Reserve as work 6,L
Bload "Mymap.map",start(6)
TILE BANK b
```

Changes the TILE value list bank from the default of 8 to "b". This is very handy if you want to keep multiple TILE value banks in memory at one time.

```
=MAP CHECK
```

This function will run through the map data, checking all the tiles used in the map against those available in the tile bank. If a tile is used in the map which isn't available in the tile bank, then the function will change its tile number to zero. MAP CHECK returns the number of tiles that it has had to change.

OH GOODIE!

The AMOS TOME Goodies Disk is only available to registered AMOS TOME Users, and includes three new games written with AMOS TOME. These are: *Magic Forest II*, a horizontal scrolling platform game. *Green Flag* , an Isometric 3D scrolling game. *The Dungeon*, a dungeon Master style 3D dungeon game. All three are supplied in AMOS 1.3 form, so that you can use the routines in your own games. The TOME Goodies Disk 1 costs £5 and is only available to registered *TOME* users who have sent in their registration card.

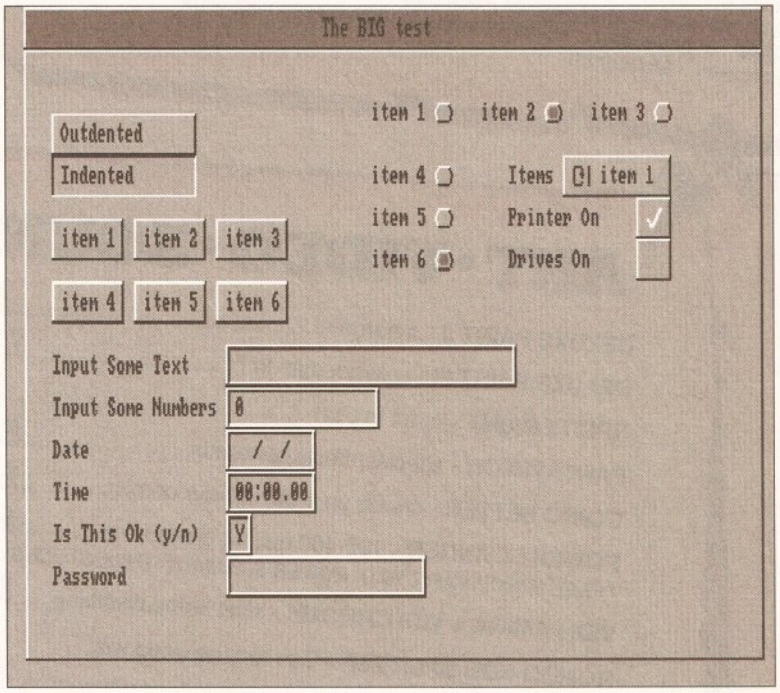
CONCLUSION

AMOS TOME is just one of those things you *have* to have if you're serious about AMOS. *TOME* costs just £24.99 (or £19.99 to AMOS Club members) from Shadow Software. The next upgrade is said to be *TOME 4*, release date expected to be some time around March 92. But don't wait for that. Install *TOME* today, and create game maps as big as your ideas.

NCOMMAND

NCOMMAND caused a bit of a surprise, as it was sent directly to me without any warning whatsoever. The idea behind it is apparently to add some commands to AMOS which make it look just like Workbench 2.0, although why you'd want to do this, I'm not too sure. But it sounded interesting so I thought I'd take a look at it. Initially I got it wrong; the purpose of the program is actually to "emulate a Workbench 2.0 environment" to produce "professional quality displays" with the minimum of fuss and bother.

The program has got a few restrictions; it uses zones 1-210 so you can't use them, it also uses icons 100-115 so you can't use them either. This shouldn't be too much of a problem if you only intend to program professional displays or utils, and besides this subsystem doesn't lend itself to games anyhow.



If you're thinking that this looks familiar, then you'd be right. *NCOMMAND*'s purpose is to emulate that authentic Workbench 2 look and feel

The *NCOMMAND* commands are actually a set of AMOS procs, so you don't have to install them directly to the system and they don't become part of the system. You simply load up the *NCOMMAND* program, add your program to the bit in the code where it says *add your program here*, and then use the commands in the setting up of your screens.

The command set includes all the usual Workbench 2.0 stuff like buttons, check boxes, rotating requesters, boxes, text lines where you can add text, and number requesters too.

In addition to the above the colour palette has been chosen to coincide with the Workbench 2.0, colours, and the effect, although not exactly like Workbench 2.0 is very professional.

NCOMMAND adds a lot of new instructions (such as Procs) to your programs. Unfortunately this does mean that every program you merge with *NCOMMAND* goes up in size by the size of *NCOMMAND*, which amounts to about 63K. Still, if it's a small util you're creating, you're not going to worry about that too much. The documentation details the new commands at your disposal in a nicely DTPed paper manual, which also has instructions on how to use the program.

DON'T FORGET...

The AMOS conference which can be found on CIX, has bundles of programs and bags of hints and tips for all AMOS users.

Join CIX by dialling their voice line and asking for details on 081 390 8446, or just log on to 081 390 1244 and have your credit card ready.

TO SUM IT ALL UP

NCOMMAND is well programmed. Although it is not an exact replica of Workbench 2.0 buttons etc, it's good enough to pass for it at a glance. And this is a very clever way of adding commands to the system without actually building an extension module, as Aaron Fothergill did for *TOME*.

No sir, this is straight AMOS, and very good it is too. Congratulations are in order to the author Dennis Leech for coming up with such an original and well organised utility.

TIME TO GO

OK, that's all we have time for this month. Sad to say there was no room for our usual AMAL tutorial or AMOS PD reviews, but no big loss, we'll catch them again next time. Join me again next issue for more AMOS action. See you then! AS

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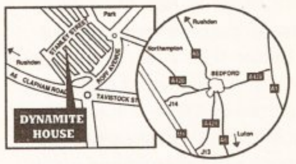
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"If MIDI throws you into a muddle, then that's where I step in. Magic with your MIDI was never easier."
Paul Overaa

Don't skip

In this month's instalment Paul Overaa takes a look at the MIDI standard and explains just how the various classes of MIDI messages can be categorised...

The other day I was asked why the MIDI Standard doesn't get altered to include more channels. Although a lot has been written about MIDI messages, their layouts and their uses, no-one seems to have dealt with the structure of these messages from an 'overall plan' type of viewpoint. As it is the MIDI spec's status byte structure definition which limits the MIDI messages that can be formed it seemed worthwhile spending some time discussing how the various message classes were created.

Before this, a few words about the main categories of messages supported by MIDI: At the highest level MIDI distinguishes between Channel messages (those which contain a channel number) and System messages. Channel messages can be one of two types – Voice messages, which are concerned with creating melodies/rhythms and selecting various sounds etc, and Mode messages which define different message interpretation schemes. System messages deal with the transmission of information of interest to the MIDI system and they come in three forms: Common, Real-Time and System Exclusive (SYSEX).

STATUS BYTE LAYOUT

For the moment it's the status byte layout which concerns us: Status byte values have the most significant bit of the byte (bit 7) set high. However this distinction is only the beginning of the hierarchy within the multi-byte MIDI message system, but it's not hard to see that this scheme immediately limits the number of different messages that MIDI can use there are effectively only 7 bits of the status byte available to represent different message types).

Now let's look at the status byte bits b6 – b4. These can form eight different patterns: 000, 001, 010, 011, 100, 101, 110 and 111. Seven of these are used to define channel messages as shown in Figure 1.

Figure 1: Channel messages in the status byte

b6	b5	b4	Message Type
0	0	0	Note Off
0	0	1	Note On
0	1	0	Polyphonic key pressure
0	1	1	Control Change
1	0	0	Program Change
1	0	1	Channel Pressure
1	1	0	Pitch Bend Change

These bit patterns have been designated as channel messages. Where does the channel number go? It's stored in the lowest four bits b3-b0 of the status byte number. Channel numbers 1-16 are stored internally as the numbers 0-15, so a note-off status byte for channel 1 is represented as shown in Figure 2.

Figure 2: A note-off message to channel one

b7	b6	b5	b4	b3	b2	b1	b0
1	0	0	0	0	0	0	0

This is the status byte indicator bit (b7)

This shows we've got a note-off message (b6–b4)

These bits give the channel number 0000 = channel 1 (b3–b0)

This, incidentally, explains why the 16 conventional MIDI channels limit exists: Four bits b3-b0 can *only* store 16 different patterns... 0000, 0001, 0010, 0011, 0100, 0101, 0110, 0111, 1000, 1001, 1010, 1011, 1100, 1101, 1110, and 1111. So, unless the whole of the status byte was redefined and expanded, it's impossible to include more than sixteen channels.

In defining the channel message status bytes, the bit patterns have taken up all of the combinations in the upper four bits except for one... the pattern 1111. I didn't include this combination in the above discussion as it has nothing to do with channel messages at all – it has been reserved for various system messages as shown in Figure 3.

For these System messages, bits b6-b4 can only take the value 111, because all of the other combinations have been used to represent channel message types. So how are the System messages represented? It's easy... System messages *do not* have a channel number, so bits b3-b0 can be used to identify 16 different types of system message. What happens is that b3 is used to indicate one of two message sub-classes. If the value of b3 is zero we have a group that, with the exception of SYSEX status byte (which defines its own special group of 'non-standard' messages), are collectively called System Common messages. Figure 4 shows how the bit values fit into the overall scheme of things.

Figure 3: The status byte signifying a system message

b6	b5	b4	Message Type
1	1	1	System Messages

If bit 3 is set high (ie to 1) we get the sub-group, called the real-time message group as shown in Figure 5.

That's covered the ideas behind the status byte, now we can look at the purposes of the messages...

SYSTEM MESSAGES

The messages vary in length... some are single byte, some contain 2-3 bytes, others more. Real-time (RT) messages contain a single byte, ie the status byte is actually the whole message. There are RT messages for Start (decimal 250), Stop (decimal 252), Continue (decimal 251), Active-Sensing (decimal 254), System-Reset (decimal 255), and Timing-Clock (decimal 248).

Start, Stop and Continue announce the obvious... if for instance you hit the start button on a drum machine, it will transmit a 'start' message. Active Sensing is one of those background messages you'll never see in your sequencer event lists – units which implement active sensing can tell whether there are communications problems by

a beat!

Figure 4: The various MIDI system messages

b3	b2	b1	b0	Message Type
0	0	0	0	SYSEX Message
0	0	0	1	Midi Time Code
0	0	1	0	Song Position Pointer
0	0	1	1	Song Select
0	1	0	0	Undefined
0	1	0	1	Undefined
0	1	1	0	Tune Request
0	1	1	1	End of System Exclusive

transmitting 'dummy data', streams of active sensing messages, during the times when there is no other data on the MIDI line. If a unit which was receiving such messages suddenly finds that there is no real MIDI data and no active sensing messages either then it will switch off its sound generators as a safety precaution. When you buy a piece of MIDI equipment you'll get a manual including a MIDI Implementation Chart. This gives a standardized summary of the facilities on offer and you'll see details on active sensing. System Reset is a command which will force a piece of equipment to assume a 'just switched on' state.

Timing clocks are transmitted by sequencers, drum machines, master keyboards etc, as a means of keeping everything 'in sync' – since they provide a timing reference to be used by all units, it's obvious that only *one* MIDI unit should be generating them at any one time. You'll also read about three common messages... Tune Request (decimal 246) asks all synthesizers to tune their oscillators. Song Select (decimal 243 followed by a number from 0 to 127) enables you to specify a song by providing a reference number – if, for instance, you've a selection of songs programmed into a drum machine you can use this message to make selections automatically. Song Position Pointer messages allow songs and sequences to be started from places other than the beginning. They're three bytes long and consist of a status byte (decimal 242) followed by the two data bytes which identify the start. For the techies the gory details are shown below... the two data bytes are sent as low byte followed by high byte and because only 7 bits of each byte are used, you combine the lower 7 bits of each data byte to produce a 14-bit number and it's this number which identifies the starting position – it identifies the MIDI beat, (1 MIDI beat = 6 clocks) and corresponds to a starting resolution of one semi-quaver in a song, see Figure 6.

Figure 5: The real-time message group

b3	b2	b1	b0	Message Type
1	0	1	1	Continue
1	0	0	0	Timing Clock
1	1	0	1	Undefined
1	0	1	0	Start
1	1	1	1	System Reset
1	1	0	0	Stop
1	0	0	1	Undefined
1	1	1	0	Active Sensing

Figure 6: **Song Position pointer message layout... a 14 bit number corresponds to the start position in terms of MIDI beats.**

1st byte	2ndbyte	3rd byte
242	0111 1111	0hhh hhhh

hh hhh h111 1111 ← Resulting 14-bit number

bit 13 bit 0

CHANNEL MESSAGES

Channel messages constitute the largest of the MIDI message groups. In the MIDI spec these messages are divided into two sub-categories: 'Mode messages' affect the way that units interpret the data they handle, and 'Voice messages' are concerned with sound production.

Synthesizers contain sound generators, 'voices'. 'Voice assignment' is the term given to the process of routing note-on and note-off data from the keyboard (or MIDI terminals) to the voice circuitry – so that the right notes are played with the right sounds. With MIDI the relationship between the sixteen available channels and the voices also has to be defined and here the MIDI standard specifies separate modes of operation. These modes are usually selectable by front panel operations or by remote selection via an appropriate MIDI message.

There are two variables involved: The first option is whether the unit is going to receive data on *all* 16 channels or not – the term for the former state is OMNI ON, that for the latter is OMNI OFF. In short, when you select a mode that is OMNI ON based... every channel message that the unit receives will be acted upon, meaning that you loose the benefits of channel selectivity! The other characteristic under your control is whether you specify polyphonic or monophonic operation. Here the situation tends to get complicated... MONO, when on, restricts the assignments of voices to one voice per channel. With POLY ON (POLY ON = MONO OFF), any number of voices can be assigned by the MIDI unit's voice assignment mechanism.

The various pairs of combinations of these choices lead to four possibilities and the MIDI standard sets out the definitions shown in tables 1 and 2...

THOSE MIDI MODES

Well, that covers the details. Now for the question which everyone asks at one time or other... What does it all mean? Here's a condensed version of the main ideas: Mode 1, because it disregards channel info, is only useful as a 'fail safe' mode. A unit set to Mode 1 will respond to any channel message it receives. It's useful for trouble-shooting, checking leads etc, but there are few occasions where you would deliberately want a single unit to respond to data from all channels!

Mode 2 (OMNI ON / MONO) is another mode which ignores channel selectivity. You can forget about this mode – rumour has it that the definition was a mistake and it has no obvious advantages or uses!

Mode 3, (OMNI OFF/POLY ON) is the most widely used of all the MIDI modes. Synthesizers will transmit polyphonic data on the selected channel, and any receiving equipment which is in this mode (and set to receive on the same channel) will interpret and use the information to play polyphonically.

Mode 4 is special. With Mode 4 selected each synthesizer voice gets its own channel number. With an 8 note polyphonic synthesizer tuned to basic channel 1 the first voice responds to data received on channel 1, the second to data on channel 2 etc. In other words Mode 4 uses a 'user-definable' set of MIDI channels for its operations. As far as applications (eg MIDI guitar control) go, there are some grey areas but there's no doubt that it does have some interesting potential.

Although there are only four official MIDI modes, the facilities now offered on some expander units have added an interesting new slant to the MIDI mode debate. Many multi-timbral expanders and synthesizers can now be set up to behave as though they are two or more separate synthesizers each controlling their own voices and responding to their own channels.

continued on page 119

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MODE	OMNI	POLY	
1	ON	ON	Voice messages are received on *all* channels and assigned to voices polyphonically.
2	ON	OFF (ie MONO ON	Voice messages are received on *all* channels but control only one voice.
3	OFF	ON	Voice messages are received on the selected channel N and are assigned to voices polyphonically.
4	OFF	OFF (je MONO ON	Voice messages are received in voices N, up to (N+M–1) and are assigned monophonically to voices 1 thru M. The number of voices is specified by the third byte of the MONO Mode message.

Table 1: Receiving Equipment Mode Definitions (for a receiver assigned to a Basic Channel N)

continued from page 117

Some of Mode 4's uses have therefore been rather quenched by the multi-timbral facilities now available with many units.

Explaining the MIDI Mode messages is easy – they are 3 bytes long and have the same status byte (written in binary as 1011nnnn where the lower four bits 'n n n n' are the binary form of the channel number). The data bytes which follow enable you to set Omni Mode On (decimal 125, 0), Omni Mode Off (decimal 124, 0), Mono Mode On (decimal 126 followed by a byte specifying the number of channels) and Poly Mode On (decimal 127, 0). There are a few other messages, including local control messages and a panic button 'All Notes Off' message, which have also been placed in the Channel Mode Message group.

VOICE MESSAGES

The MIDI channel 'voice' messages are about sound production. There's quite a collection but the ones which get used more than any other are those which turn notes on and off. When you press a key on a synthesizer keyboard three pieces of data get transmitted – first a status byte which announces that a key has been pressed, secondly a number identifying the key itself (Middle C is assigned a value of 60 and for every semitone above or below this the note number changes by plus or minus one). Last is a number which tells the receiving equipment how hard this key has been hit. In MIDI terms the last piece of information is called the velocity byte and at the end of the day (and in less than 1/1000th of a second) this travels down the MIDI lines as in Figure 7.

This message format (with one exception that I'll look at in a moment) is fixed and this means

MODE	OMNI	POLY	
1	ON	ON	Voice messages are
2	ON	OFF (ie MONO ON	One voice message is sent on Channel N
3	OFF	ON	Voice messages are transmitted on selected channel N
4	OFF	OFF (ie MONO ON	Voice messages for voices 1 thru M are transmitted in voice channels N thru (N+M–1)

Table 2: Transmitting Equipment Mode Definitions (for transmitters assigned to channel N)

course that all MIDI keyboards have to transmit velocity data – even those without touch sensitivity. The big difference is that touch sensitive keyboards work out how hard you've hit the keys, and translate that 'pressure' into a velocity value between 1 and 127. Non touch sensitive keyboards transmit a fixed 'default' value (decimal 64) instead.

NOTE OFF MESSAGES

As you release keys on the keyboard, streams of messages must be transmitted to indicate the notes to be turned off. The MIDI standard allows two ways of doing this...

Firstly the keyboard can send an equivalent 'Note-Off' message. This contains three bytes but although it takes the same form as a 'note-on' message, it uses a different status byte as in Figure 8.

A second way that 'Note-Off' information can be transmitted is by sending 'Note-On' messages using zero for the velocity value. With this approach the equipment loses the ability to transmit a 'release velocity' value, but it gains an important potential advantage in another area.

When the second approach is used the messages which turn notes on and off are transmitted in terms of streams of MIDI's 'Note-On' messages. Why is that useful? It just so happens that part of the MIDI specification defines 'running status', which allows all messages after the first one to be transmitted without their status bytes – providing they form part of a stream of identical message types. The benefit of turning notes on and off using Note-On messages is that running status enables a third of the transmitted data to be eliminated – quite a significant saving.

Well, that's about it as far as note-on and note-off messages are concerned. The Program Change message, discussed earlier in the series, is another from the voice message group and there are a few more voice messages that ought to be mentioned. Three of them... polyphonic key pressure messages, controller messages and pitchbend messages can (in certain circumstances) be sent down the MIDI lines in vast quantities.

Figure 8: Equivalent layout of a MIDI note-off message

1000nnnn NOTE OFF STATUS BYTE	0xxxxxxx NOTE NUMBER	0vvvvvvv VELOCITY DATA
↑	↑	↑
Identifies the message type and the channel number	Identifies the note	This gives the 'release' or 'key-off velocity'

Because of this, their indiscriminate use can lead to two types of problems... firstly sequencer memory can get 'eaten up' like there's no tomorrow, and secondly you may experience 'MIDI-clogging' problems owing to the fact that too much information is being transmitted.

The Aftertouch message layouts were provided last month so there's no point in repeating the details. Pitchbend (Pitchwheel) messages are sent whenever the pitch wheel or lever changes position and they take the form shown in Figure 9

CONTROLLER MESSAGES

MIDI's controller messages are an area which cause more confusion than expected. Part of this stems from the fact that many people are under the impression that there are many different controller messages involving switches, continuous controllers, and both high and low resolution facilities. It's true that several types of MIDI controller are available – but there is only *one* type of MIDI controller message and once you understand its format and the way it is used, all of the categories of controller use will fall into place.

A MIDI controller message requires three bytes and takes the general form shown in Figure 10.

The first byte, the status byte, is the value B0 hex combined with a channel number. The two bytes which follow are both MIDI data bytes, so they can *only* take values between 0 and 127 (0 hex – 7F hex). The second byte of a controller message is termed a controller number and although it could take values as high as 127 it's limited to 120 for controller number purposes – the MIDI specification has used values 121-127 for other purposes (local control, all notes off and the mode messages). Another simplification is that, at the moment, the controller numbers 102-120 are undefined, so you don't need to worry about them. We can also knock out the 96-101 controller range because these have been assigned for rather specialised increment/decrement/parameter-number uses.

That, to all intents and purposes, brings us down to a set of controller numbers from 0 to 95 and these are

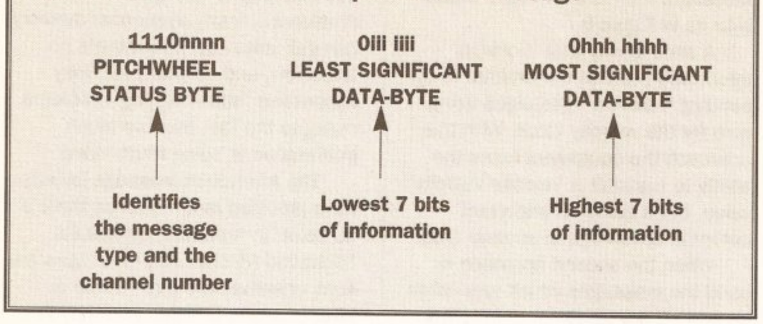


Figure 9: General form of a pitchbend message

split into two groups, switch controls and continuous controls, which I'll now try to explain in detail...

SWITCH CONTROLLERS

The switch controllers (there are 32 of them) are the easiest to deal with because they're just the MIDI equivalent of an on/off switch. The third byte of a switch message can take one of two values... 0, which means that the switch is off, and 127 (ie 7F hex) which means that the switch is on. Switch messages therefore look like Figure 11.

For controller switch use, the controller data values which fall between 0 and 127 (ie values 1-126) are meaningless and are ignored. This definition is a bit wasteful of byte-space but a more efficient bit encoding scheme, eg perhaps representing 7 switches per single controller message (using one bit per switch), would have meant that such messages would take longer for the receiving equipment to decode.

Examples? If you look at the MIDI Implementation sheet for Yamaha's TX81Z expander you'll see that switch numbers 64 and 65 are used to control sustain and portamento. Since 65 decimal = 41 hex it's not too difficult to work out that, if the unit was set to channel 16, the message which would turn the portamento on would consist of the three values BF hex, 41 hex, and 7F hex. The equivalent message which turns the portamento off would just use a zero last byte rather than the 7F hex 'switch on' value.

ONGOING MESSAGES

Controller numbers 0-63 are known as continuous controllers and these probably are the worst offenders as far as confusion goes. To start with they do *not* represent 64 different 'controllers' – they're effectively only meant to represent 32 physical devices. Here's the reason why...

A continuous controller can be thought of as an analogue dial which can be adjusted from a low value, zero, to a high value which actually has the numerical value 3FFF hex. If you convert these to decimal values you'll find that means these controllers can be adjusted from 0 to 16383. These number ranges were selected so that a high resolution, (ie a 'dial' containing many different intermediate states) could be used. From the viewpoint of those who defined the MIDI standard the use of continuous controllers presented two problems: first of all the proposed high resolution might not always be needed. Secondly, because a single controller message can only carry a 7-bit controller value, some alternative means of representing the full controller value (which needs 14 bits) had to be found.

The solution, which has been subjected to more than its fair share of criticism, was as follows: If you look at the 3FFF hex maximum value and express it in binary form you'll see that it does indeed need 14 bits since 3FFF hex = 11 1111 1111 1111 binary. If you take those bits and divide them into two groups – you have two groups each consisting of 7 bits. The left hand group contains the most significant bits of the number, whereas the right hand group contains the least significant.

If you return to the generalized controller message you'll see that there's only space for *one* data value. So, how are continuous controller messages sent which need the full 14 bits, ie need 2 data bytes, to specify the 'controller position'? It's easy... *two* different controller messages are transmitted. How do you tell which part of the data value is being transmitted? Each continuous controller is assigned *two* different controller numbers. One number says 'here comes a new value for the highest 7 bits of the controller data value', the other says 'here comes a new value for the lower 7 bits'. Which values are used? Controllers 0 – 31 carry the most significant bits (MSB), Controllers 32-63 carry the least significant bits (LSB). Controllers 0-31 and controllers 32-63 are paired and in reality each pair (0/32, 1/33, 2/34 etc.) represents the values for the same physical controller.

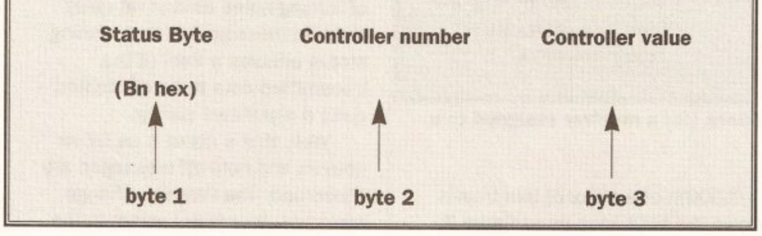


Figure 10: General form of a MIDI controller message

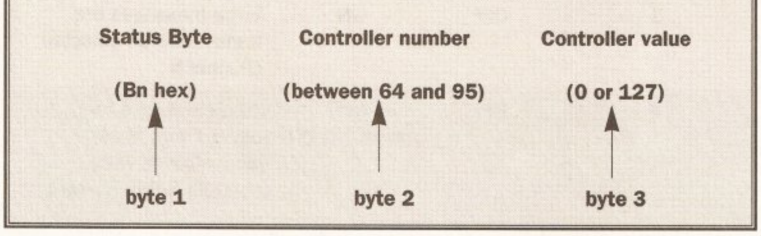


Figure 11: MIDI switch control messages

The MIDI standard, in an attempt to save space on the communications lines, allows for partial transmission of these continuous controller data values. It states that it is only necessary to send both parts of the controller value if... both parts are needed and both parts have changed in value. In other words if a manufacturer only wants to implement some particular low resolution controller facility it can arrange to transmit and recognize controller messages using a controller number between 0 and 31.

By taking the Yamaha TX81Z mod-wheel control as an example I'll show how this works in practice: In general, MIDI Controller 1 is designated as the modulation wheel's MSB and controller 33 represents the LSB part. Yamaha's TX81Z implementation chart shows that the unit recognises controller number 1 messages, but doesn't recognise controller 33 messages. It shows that Yamaha has implements low resolution mod-wheel control.

Nothing can change this, so even if a keyboard could send high resolution mod-wheel messages to the TX81Z (which would consist of a combination of controller 1 and controller 33 messages) the TX81Z, because it only understands the controller 1 messages, would still provide low resolution response.

The use of high resolution controllers means that more data has to be transmitted but, it's not always necessary to transmit both parts of the controller's data values. If some recognised control movement results only in a change in the LSB part of the controller value... then only one controller message (the LSB part) need be sent.

The controllers specified in the MIDI standard are a description, a logical blue-print, of 32 switches and 32 'dial type' continuous controllers. The relationship between the controllers and particular effects is 'soft', ie it exists only in the eyes of the software controlling the transmitting and receiving equipment. There's no reason why controller 1 messages, sent by an instrument which is registering the effects of mod-wheel changes, couldn't be mapped by the receiving equipment to some other synthesizer/voice characteristic. This is the idea behind the use of assignable controllers which let you decide which controller number will be used when a dial or pedal is moved, and lets you decide which effect will be modified when a controller message is received. Many controllers now have standard recommended uses (1=mod-wheel, 2=breath-control, 7=volume etc.) but it's unlikely that we'll ever see 100% standardisation, so synths and expanders with assignable controllers will always give you that bit more flexibility.

Next month I'll complete these 'techie' discussions by looking at MIDI's SYSEX messages, at some fault-finding/diagnostic schemes. I'll also be talking about areas which become important as you get into more advanced MIDI use... AS

JARGON BUSTING • JARGON BUSTING

Bit positions – It is common practice to label the 8 bits of a byte (just another name for an eight bit binary number) as b7, b6, b5...b0 with bit b0 being the least significant bit, ie the one on the far right of the number. Bit 7 is therefore the most left hand bit – the one which, when set high, indicates a status byte.

Portamento – A sound effect created by rapidly sliding from one note to another – today almost all synthesizers have in-built circuitry for producing portamento effects.

TX81Z – A programmable 8 note polyphonic sound expander module by Yamaha.





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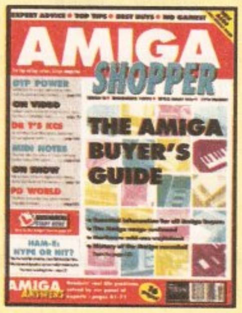












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Cliff's Code Conundrum

Once more Cliff's here to test your programming mettle and reveal the winner of December's teaser

This month's conundrum is an easy one; but then, I always say that don't I? Well, I'm only trying to encourage you to have a go. Anyway, what I want this time is a program that will convert from denary to other number bases.

The user of the program is to give it three inputs: the number base to which everything should be converted, and the start and end values (in denary, of course) that should be computed. The resultant output should be a table presenting a list of denary numbers along with their equivalents in whatever wacky base the user has chosen.

If the user specifies a number base above ten, then use the same system as is used in hexadecimal – use the letters of the alphabet to represent digits with a value greater than nine.

And those of you who aren't sure what all this denary and number base nonsense is about could do worse than check out my series on programming starting on page 133.

So, er, that's it. Good luck. May the best coder win, and may all your Christmases be white.

As usual, send your answers in on an AmigaDOS formatted disk, along with any relevant documentation, and enclose an SAE if you want it back. Feel free to use any language you like, but don't forget to include source code if you've used a compiler or an assembler. The closing date for entries is 7th March, and the prize is the customary £50.

THE RESULTS ROUND-UP

It gives me a near preposterous amount of pleasure to announce that the winner to issue 8's conundrum is Michael Gordon of Edinburgh.

The task was to write a program which performs basic analysis on a text file, giving statistics about number of commas, colons and so on. All of the entries received work, but Michael's, written in C, is one of the few that could deal intelligently with abbreviations ('e.g.' for example). It is also very fast and efficient on memory usage. Well done Michael, you'll be receiving a cheque for £50 in the near future.

I've had a few enquiries about what is and what isn't important in entries. A flash front end is all very well, but not what I'm judging; what I want to see are elegant and efficient programs to solve the problems. Comments in programs are useful, because they help me follow a listing through, and they are, after all, one of the elements of good style. Finally, speed is important, but not to the exclusion of everything else – and I won't be making any direct comparisons between a program in Basic and one in assembler. AS

```
/* count.c - M. Gordon
 * 10/10/91 * Compile with:
 * lc -cfist -Lm count.c */

#include <ctype.h>
#include <string.h>
#include <stdlib.h>
#include <stdio.h>

char *prog_name;
int num_sentences,num_words,
num_commas,num_colons,num_sem
icolons;
/* Reads the next sentence of
the file into a dynamically
grown buffer and returns a
pointer  also keeps track of
the number of words in the
sentence. The function is
complicated by the neccssity
of handling abbreviations.
When we find a full stop we
do the following:-
If it's followed by anything
other than a space  we're
part way thru an abbreviation
and we carry on. If it's
followed by a space it's
either the final full stop of
an abbreviation in the middle
of a sentence or, if the next
non-space character is a
capital letter, the end of a
sentence. While this is not
perfect, it's simple to
program and gets it right
most of the time. */
char *get_sentence(FILE *fp)
{
  static char *buffer=NULL;
  static int buffer_size=80;
  int length,num_spaces,c;
  if (buffer==NULL)
    if ((buffer=calloc(↵
buffer_size,sizeof(char)))↵
==NULL) {
      fprintf(stderr,"%s:↵
can't init sentence buffer↵
\n",prog_name);
      exit(1);
    }
  length=0;
  while ((c=getc(fp))!=EOF) {
    buffer[length++]=c;
    if (length>=buffer_size-5)
      {
      buffer_size *= 2;
      if ((buffer=realloc↵
(buffer,buffer_size*sizeof↵
(char)))==NULL) {
        fprintf(stderr,"%s:↵
can't grow sentence buffer↵
\n",prog_name);
        exit(1);
      }
    }
    if (isspace(c))
      num_words++;
    if (c=='.') {
      num_spaces=0;
      while (isspace(c=↵
getc(fp)))
        num_spaces++;
      ungetc(c,fp);
      if (num_spaces>0) {
        buffer[length++]=' ';
        num_words++;
        if (isupper(c))
          break;
      }
    }
  }
  buffer[length]='\0';
  if (length==0)
    return(NULL);
  else
    return(buffer);
}

void process_sentence(char
*sentence)
{
  char *p;
  num_sentences++;
  p=sentence;
  while (*p) {
    switch(*p) {
      case ',':
        num_commas++;
        break;
      case ':':
        num_colons++;
        break;
      case ';':
        num_semicolons++;
        break;
    }
    p++;
  }
}

void print_results(char
*file_name)
{
  printf("File ↵
%s:\n",file_name);
  printf("\tsentences:%d ↵
words:%d\n",num_sentences,↵
num_words);
  printf("\tcommas:%d ↵
colons:%d semicolons:%d\n\n"↵
,num_commas,num_colons,↵
num_semicolons);
  if (num_sentences>0) {
    printf("\tAverages per ↵
sentence:\n");
    printf("\t\twords:%-↵
8.2f",(double)num_words/↵
num_sentences);
    printf("commas:%-↵
8.2f",(double)num_commas/↵
num_sentences);
    printf("colons:%-↵
8.2f",(double)num_colons/↵
num_sentences);
    printf("semicolons:%-↵
8.2f\n\n\n",(double)num_↵
semicolons/num_sentences);
  }
}
main(int argc,char **argv)
{
  char *sentence;
  int num_errors;
  FILE *fp;
  /* dig the final component
of the name out of argv[0] */
  if ((prog_name=strrchr↵
(*argv,'/'))==NULL) {
    if ((prog_name=↵
strrchr(*argv,':'))==NULL) {
      prog_name=*argv;
    } else {
      prog_name++;
    }
  } else {
    prog_name++;
  }
  argc-;argv++;
  if (argc<=0) {
    fprintf(stderr,"usage: ↵
%s file ...\n",prog_name);
    exit(1);
  }
  num_errors=0;
  while (argc) {
    if ((fp=fopen↵
(*argv,"r"))==NULL) {
      fprintf(stderr,"%s: ↵
can't open %s\n",prog_name,↵
*argv);
      num_errors++;
    } else {
      num_sentences=↵
num_words=0;
      num_commas=↵
num_colons=num_semicolons=0;
      while ((sentence=get_↵
sentence(fp))!=NULL)
        process_sentence↵
(sentence);
      fclose(fp);
      print_results(*argv);
    }
    argc-;argv++;
  }
  return(num_errors);
}
```

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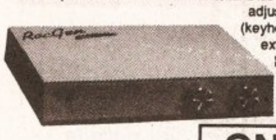


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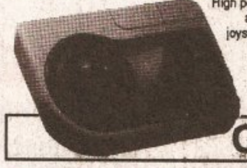
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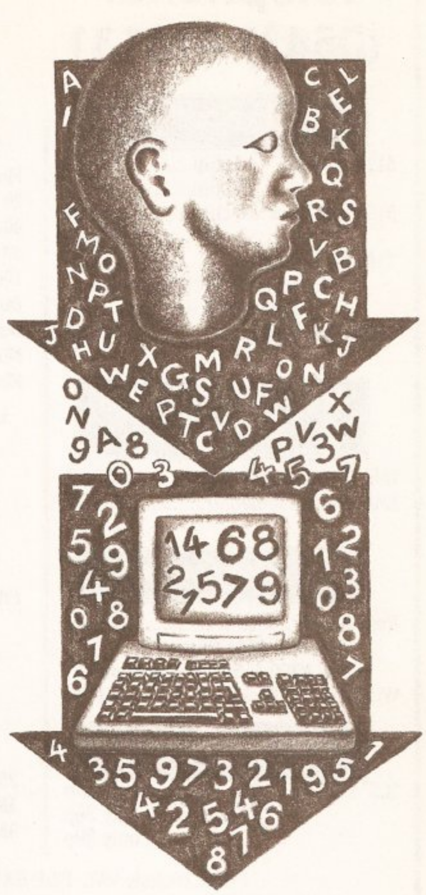
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You Too Can Program



Learn to program like a true professional with a little help from Cliff Ramshaw...

If you're a beginner, a brief glance through the programming-orientated articles in *Amiga Shopper* has probably convinced you that you don't understand it and that it's all beyond you. Pieces of code look terribly obscure, there's all sorts of talk of libraries and Intuition messages and so on, and there's a horrendous amount of jargon.

In fact, programming is easy.

As with anything else, it's a matter of learning the basic principles first. Once you have these under your belt, you'll find yourself solving more and more complex problems without a qualm. Before long it will be time to delve into the innards of the Amiga and start doing some really fancy things.

One of the great benefits of learning to program is in gaining a better understanding of your machine. You'll begin to see how other people's programs work, and to know what is and what isn't possible on the Amiga. You'll feel much more comfortable using the machine, and more confident to boot. And, apart from anything else, programming itself is great fun.

This series aims to take you, gently, from programming ignorance to a state of competence. Most of the principles I'll be discussing are general; they're applicable to any language. It will be necessary from time to time to use short code examples, and in these cases the language used will be Basic.

GOING WITH THE FLOW

A program is written as a series of statements, representing an instruction to the computer, and usually each is on a separate line. In the normal course of events, each statement is executed in turn, from the start of the program at the top to the end at the bottom.

The order in which the statements are executed is called the 'program flow'. It is possible for the programmer to control the program flow with the aid of 'flow control' language statements – this being one of the main reasons why computer programs can be so powerful. We'll look at flow control in-depth later.

EASIER THAN SPEAKING

Program languages are very different from spoken languages such as English. For one thing, they have a very much smaller vocabulary. Also while English is rich with potential for metaphor and ambiguity, every statement in a program language must have a single, precise meaning.

Much more care must be taken over the ordering and structuring of statements in a programming language. In English you could say 'I took the dog out' or 'the dog was taken out by me' and be understood in both cases. With a programming language, there is usually only one correct way to express something. Also, characters such as punctuation marks are of crucial importance and can only be used in specific places for specific reasons.

OUT WITH THE NEW

Well, it's about time to start writing a program. Most of what we discuss here will be very simple Basic, so whether you are using AMOS, Amiga Basic, GFA or whatever, you should have no problems in getting anything to work.

One of the first requirements of your program will be to produce some output on the screen – that way you can easily tell whether or not it has worked properly. The classic beginners' programming example is the 'hello world' program, which, as you might expect if you've been following carefully, prints the words 'hello world' to the screen. The Basic program to do this is shown below:

```
Print "hello world"
```

It's pretty short, isn't it? The 'Print' statement is a Basic instruction to send output to the screen. It can send lots of different kinds of things, but by enclosing the following text in quotes we've instructed it to print the text exactly as it is written.

A program to print two lines of text looks like this:

```
Print "hello world"
Print "how are you doing?"
```

At the end of a 'Print' statement, the Amiga assumes that output has finished on that particular line, and that any further output should be sent to the next line. You can overide this assumption by ending the 'Print' statement with a semi-colon:

continued on page 135

JARGON BUSTING • JARGON BUSTING

Address – A number used to refer to a specific memory location.
Assignment – The process of storing a value in a variable.
Basic – Beginners' All-purpose Symbolic Instruction Code, a language designed to teach people to program.
Binary – A number system consisting of two digits (zero and one), useful because it corresponds directly to the electronic signals used in logic circuits.
Bug – A mistake in a program.
Compiler – A program which translates other programs wholesale into the machine code that the central processor understands.
CPU – Central Processing Unit, the controlling part of the computer which follows all program instructions.
Data – A computing term for information.
Denary – The number system used by everyone, which makes use of ten digits.
Hexadecimal – A number system used by programmers which makes use of sixteen rather than ten digits.
Input – A Basic statement which takes a value typed by the user and puts it in a variable.
Interpreter – A program which translates other programs line by line into the machine code that the central processor understands.
Machine code – The set of instructions understood and followed by the central processor.
Memory – Set of chips used to store information and programs.
Operating system – A program which runs continuously and provides 'house-keeping' facilities.
Program counter – A register inside the central processor which keeps track of where the next instruction to be executed is held in memory.
Print – A Basic statement which puts information on the screen.
Register – A memory location within the central processor.
Variable – A number of memory locations grouped together and referred to by name, of use for storing information.

THE OPERATING SYSTEM

If, you may be wondering, the computer is constantly executing instructions, why does it appear to be doing nothing when it's first switched on? In fact a number of programs are running which collectively make up the operating system.

The operating system performs the house-keeping operations of the computer – it makes the disk drives work, reads the keyboard and mouse, displays text on the screen and so forth. It is especially complicated on the Amiga because of the computer's multi-tasking ability. More than one program can be running at once because of a timing trick carried out by the operating system. It devotes a little bit of the processor's time to each programming running in turn – these slices of time are so small that, to the user, everything seems to be running at once, including the operating system which itself is another program running along with the others.

It's not really necessary to know too much about the operating system when writing simple programs, but it's as well to bear in mind that any program you write and subsequently run will not be the only one running on the machine.

continued from page 133

```
Print "hello world";
Print " how are you doing?"
```

will print everything on one line. Notice that there is a space between the quotes in the second line and the first word. As with everything else between the quotes, it will be printed on the screen – it is used so that the two words 'world' and 'how' are not printed as running into each other.

INCONSTANT SYMBOLISM

Obviously computer programs do more than just print text on the screen. Anything more, though, requires an understanding of variables.

Variables are imaginary containers which hold things: their contents may vary throughout the life of a program, hence their name. Every variable in a program has a name, beginning with an alphabetic character and followed by a number of alphanumeric characters.

A variable is referred to by its name, but what is actually meant by such a reference within a program is the variable's contents, or 'value' – the variable name is merely a symbol used to get at the value.

It's a good idea to choose sensible names for the variables in your programs. Then, when you look back at them, you will have some idea of what sort of values each variable is supposed to be holding.

Note that although just about any word can be used to name a variable, there are some restrictions. For one thing, there is the restriction of length: in Amiga Basic no variable name can be more than 40 characters long. More importantly, a variable cannot have the same name as one of the language instructions. Imagine the confusion if there were a variable in your program called 'print'.

A variable is a more sophisticated form of memory location. Rather than just being able to store numbers between 0 and 255, variables can store all manner of things.

Exactly what use a variable is to be put to within a program must be stated before it is used. If no other declaration is made, then the variable is usually assumed to be a number variable. Some Basics, such as AMOS, assume that the kind of number is an integer (a whole, non fractional one), and others, such as Amiga Basic, that it is one with a decimal point in it. A distinction is made because although integer numbers don't have the precision of decimal ones (called 'floating point' numbers) they are quicker to use and take up less of the computers memory, and often the precision of a decimal number is unnecessary.

Variables can have values assigned to them. In Basic, this is done in the following manner:

```
MONEY=100
```

The variable is called 'MONEY', and it has been given a value of 100. This value may subsequently used in a calculation:

```
pay=MONEY-20
```

which would assign a value of 80 (100-20) to a variable called 'pay'.

As well as subtraction, it's possible to perform addition, multiplication, division, and a number of scientific operations such as sine and cosine. Several mathematical

continued on page 139

How Computers Work

A Rough Guide

A rough understanding of how computers work is of real help to the programmer.

At the heart of the computer is a silicon chip called the central processing unit. This is the bit which controls everything else – it is the computer's 'brains' (don't make the mistake, though, of believing that computers can think – they can't). The other main element of the computer is memory where, naturally enough, information is stored. There's a load of support circuitry to aid the passing of information between the processor and the memory (as well as support circuitry to control the screen, keyboard and so forth), but these are the two essentials as far as the programmer is concerned.

Memory is a collection of individual cells, or locations. In the case of a 0.5Mb Amiga, there are over 500,000 of these locations. Each one can store a number between 0 and 255. How this information is used is entirely dependant on the processor. You may have been under the impression that computers can store more than simple numbers. In fact, it's a question of how these numbers are interpreted by the processor. Two numbers can be joined together to form a larger number; a number can be used to represent a letter (so forming part of a word); a number can represent an area of colour on the screen; or it may be used to represent part of a sound sample.

As well as having a number as its contents, each memory location is also referred to by a number. This is known as the location's address. For example, the first location in memory has an address of 0, but it could be holding any number between 0 and 255, say 36. If the processor wanted to know what was in the first location it would ask the support circuitry to provide the contents of address 0 and be presented with the result 36. This would be stored in the processor's own memory, which is much smaller (64 locations in total) compared to the external memory but can be used much more quickly since it is physically part of the same chip. The processor might then add 71 to the number in its own memory, giving the result 107. This result could then be stored back in location 0.

All operations are performed in this way – the processor's internal memory is used rather like a scrap of paper for performing quick calculations, but all of the important results are stored in the main memory. The processor follows one instruction after another, doing exactly as the instruction tells it. But, you might ask, where do the instructions come from?

As with everything else, the instructions are numbers – with each number representing a specific action that the processor must perform – and as such they must be stored in memory. A collection of these instructions forms a program. Things are beginning to get a little confusing – not only are the results of the computer's calculations held in memory, but so are the instructions which actually describe the calculations. What's going on? So far as memory is concerned, one number is the same as another – it's the processor that makes the distinctions.

One of the processor's internal memory locations (actually, several joined together so that large numbers can be stored) is called the Program Counter. This holds the number of an address in memory. The processor looks at the contents of the Program Counter, and then fetches the information stored in the location whose address is stored in the Program Counter. This fetched information is the next instruction. The processor does what the instruction tells it to, and then adds one to the contents of the Program Counter. It then goes through the whole rigmarole again, getting its next instruction from memory and dealing with it.

These instructions, known collectively as machine code, are very simple. They tell the processor to store things in memory, to retrieve things from memory, to add or subtract things, and other very basic tasks – it takes a lot of these instructions to do anything useful. Anything that the instructions tell the processor to store or retrieve is known as data, which is just another word for information. This can be put anywhere in memory so long as it is safely away from the area of memory where the instructions themselves are stored.

And that is basically how a computer works. The processor just goes on getting its next instruction from memory and doing as it's told until the power is switched off.

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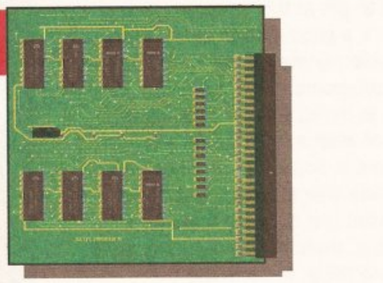
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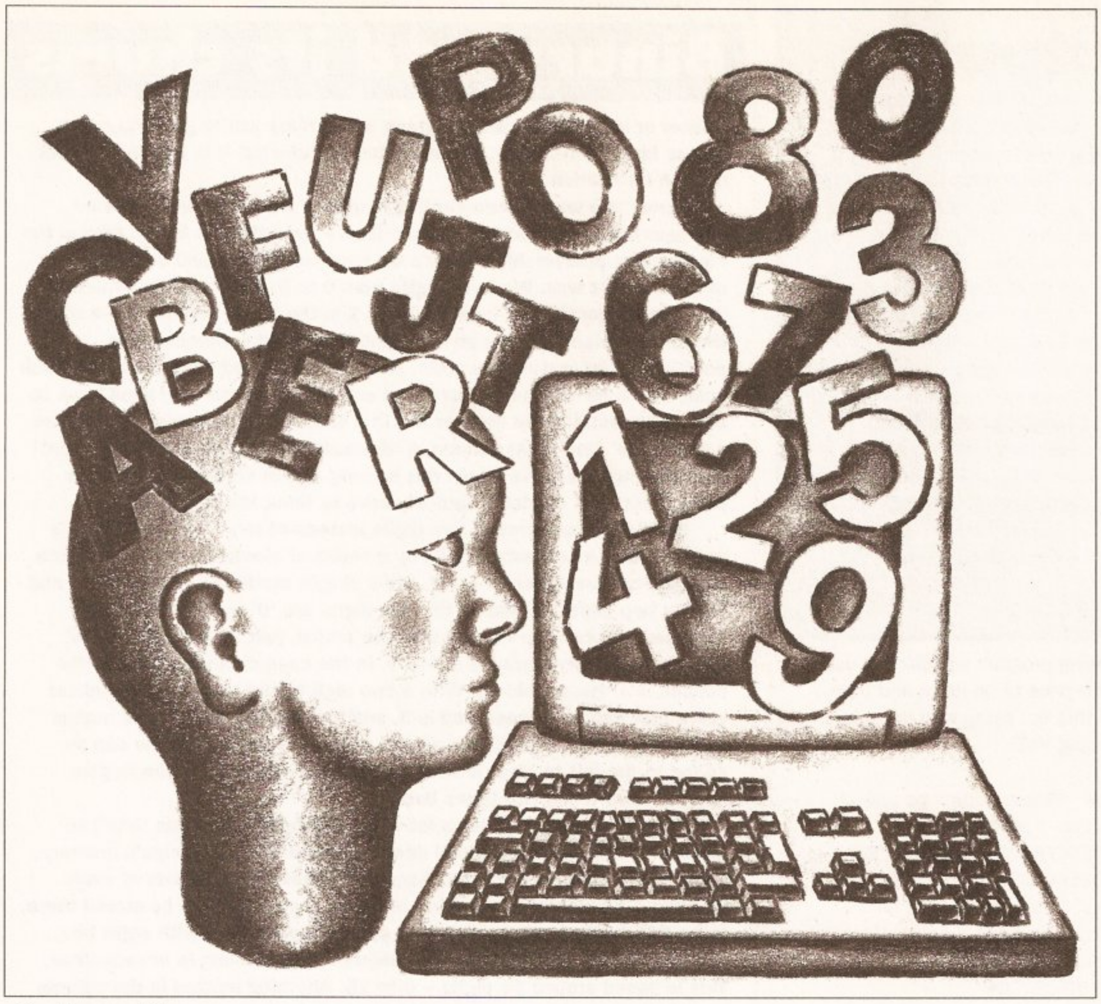
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continued from page 135

operations may appear on the same line, and in this case it's necessary to have some rules about which operations are performed first, known as the order of precedence. In most languages, including Basic, multiplication and division have a higher precedence than addition and subtraction. Eg, the following assignment to the variable MONEY:

```
MONEY=100+20*10
```

sets it to a value of 300. Because multiplication has a higher precedence than addition, the two numbers to be multiplied are done so before the addition is performed.

The order of precedence can be artificially changed by the programmer with the use of brackets. If the above example was re-written as:

```
MONEY=(100+20)*10
```

then MONEY would end up with a value of 1200. Brackets have the highest precedence of all, and in this case they have forced the computer to evaluate the addition before going on to perform the multiplication.

It's all very well being able to give variables values and to do arithmetic with them, but really we'd like to be able to see what values they hold as well. Needless to say, this is possible with Basic, and it's carried out with the Print statement, which was introduced earlier in this article.

Before, Print was used with quotes, which meant that everything within the quotes was to be printed literally.

If Print is used without the quotes, but with a variable name, then the value held by that variable is output:

```
Print MONEY
```

would output whatever number was currently stored in the variable MONEY. Both variables and text can be mixed, as in the following:

```
Print "The amount paid ↵
is";MONEY
```

Notice the use of the semi-colon. As before, it instructs the computer to print the next item immediately after the text in quotes, but it also serves another purpose: it acts as a separator between the two things to be printed; its use is necessary if the two items are to be printed with a single Print statement. Any number of items can be included in a single Print statement, up to the line length limit of the particular Basic you are using, but each of them must be separated from the rest.

As well as the semi-colon, it is possible to use a comma as a separator. This has a slightly different effect. Whereas a semi-colon meant 'print the following on the screen immediately after the preceding output', a comma means 'move to the next tab position across the screen, and print the following'.

Tab positions are ways of organising the screen into vertical columns. In Amiga Basic there are six, with the first starting at the left-hand column of the screen and the second being fifteen spaces along to the right. Commas are useful as separators when you are printing out lists of numbers, since they allow information to be tabulated in a neat way onscreen.

GETTING IT IN

Now that you know how to mess around with information inside the computer and how to print it out, you might be interested to know about getting it into the computer in the first place. This is usually handled in Basic with the 'Input' statement, followed by the name of a variable:

```
Input MONEY
Print "The amount you ↵
entered is";MONEY
```

When a program is running and the computer comes across an Input statement, it stops what it is doing and waits for the user to type a response. In AMOS and Amiga Basic, it lets the user know that it is waiting by printing a question mark. The user then types in the required input, presses [Return], and the program carries on, with the value the user typed being stored in the variable following the 'Input' statement.

continued on page 140

Interpreters and Compilers

Programs are written with the aid of an editor – a kind of word processor – and are stored as text files. Each character of a program is represented by a number between 0 and 255. All of the characters, reading from the top left to the bottom right of the program, are stored consec-utively. Once in memory, each of its characters is stored in a single location.

In a language such as Basic, each instruction is made up of one or more words, which in turn are composed of several characters. These are not the same as the machine code, mentioned earlier, which the Amiga's processor understands. Before the Basic instructions can be processed they must be translated into machine code by another program.

There are two different approaches to the problem of translation. The first is that employed by an interpreter program such as AMOS or Amiga Basic. An interpreter is a machine code program. It looks at each line in turn of a user's program, works out which instruction the line represents, and executes a set of machine language instructions to perform the desired operation. Once it has done this, it then goes on to the next line in the program and translates it in the same way. If the program is run again, then each of its lines must once again be translated – the interpreter's translation is not remembered, it is only used on the fly.

A compiler translates a user's program wholesale, producing a program which is composed entirely of machine code. This program can then be run independently of any further translation.

Input and output

Just about every program requires data to run properly. Programs can be viewed as machines which take a lump of data and convert it into another, different lump of data. An adding program is a good example: it takes two numbers as data and produces another number. The first two numbers are known as the program's 'input'; the last is the program's 'output'.

For any important application, the data is actually more important than the program. People want programs to do particular jobs – they are not interested in a program per se, only in what it will do to their data. Obviously then, when writing a program it's important to consider what kind of data it's going to need, and in what form, and what form its output will take.

One thing to realise (although you probably already have, if you've used an Amiga for any length of time) is that programs are not infallible. A program can have a mistake (or 'bug') in it, causing it to behave erratically and perhaps give false results; or it may simply be given incorrect input data, in which case its output will assuredly be wrong also. This latter case is summed up by a famous old computer professional saying, "garbage in: garbage out."

We'll discuss different forms of data in more detail once a few of the basics of programming have been dealt with.

continued from page 139

Giving the user nothing more than a question mark when your program expects input can be confusing, so it's a good idea beforehand to print a little message telling them what your program expects:

```
Print "Please enter the ↵
amount of cash"
Input MONEY
Print "The amount you ↵
entered is";MONEY
```

That's one way of doing it, but there is another, slightly shorter way. It is possible with Basic to use the 'Input' statement like a 'Print' statement, and actually print text to the screen as well as getting the value for a variable from the user:

```
Input "Please enter the ↵
amount of cash? ";MONEY
Print "The amount you ↵
entered is";MONEY
```

In this case, the message to be printed must be in quotes – it cannot be a variable – and the variable to which the value is to be input must follow the quoted message and a separator.

In AMOS, the separator must be a semi-colon, and no question mark is printed as with an ordinary 'Input'.

In Amiga Basic, either a semi-colon or a comma is used: in the case of a semi-colon, a question mark is still printed (so two would be printed in our example above); in the case of a comma the behaviour is like AMOS' 'Input', with no question mark being printed. As you can see, the differences between the various versions of Basic are many and subtle.

VAT AND ALL THAT

There's just space this month to introduce a very simple program. The following program will ask the user for the price of an item, and then print this out along with the price including VAT:

```
Input "Enter cost price ↵
of item ";COSTPRICE#
SELLINGPRICE#=COSTPRICE↵
#+COSTPRICE#*17.5/100
Print "Cost price"," ↵
Selling price"
Print COSTPRICE#, ↵
SELLINGPRICE#
```

The first line prints the message in quotes to the screen and then gets a value from the user which is stored in the variable COSTPRICE.

Note the hash signs after the variable names. This is for AMOS, and it tells the computer that the variables are to hold numbers with decimal points. The hash is not needed for Amiga Basic.

A value for SELLINGPRICE is then calculated by adding 17.5% (the asterisk means 'multiply' and the slash means 'divide', so multiplying by 17.5 and dividing by 100 calculates 17.5%) of COSTPRICE on to the unmodified value of COSTPRICE.

Next, two table headings are printed out, with a comma in between ensuring that the second heading starts at the next tab position onscreen. Finally, the values of the two variables are printed out, again separated by a comma to tab them across the screen beneath their respective headings.

Obviously the program is a little simplistic, but it will do for a start.

COMING NEXT MONTH

Next month we'll get stuck into loops and your programs will start to look much more sophisticated. Until then, experiment with what you've learnt so far – you never know what you might discover. AS

Binary and its chums

Sooner or later in your programming endeavours you're going to come across binary arithmetic. An understanding of what it is will be an asset in such a situation.

Binary is a way of representing numbers. Normally, we represent numbers in what is termed 'denary' form – everything is based around the number ten, presumably because we have ten fingers and counting evolved in this way. We have digits from 0 to 9; if we want to represent numbers higher than 9, then we put a 1 in the 'tens' column and a zero in the 'units' column, giving us the number 10. Higher numbers are achieved by increasing the units, until 9 is exceeded once more, at which point the 'tens' column is increased and the 'units' column goes back to zero – the result is the number 20. In a similar way, larger numbers have a 'hundreds' (ten tens) column, a 'thousands' (ten times ten times ten) column, and so on. We learnt this so long ago at school that it's now second nature – we don't normally have to think about it at all.

Binary is based around two digits instead of ten. The reason this is useful is that a computer works by a series of electronic switches, each of which can be either on or off. It's a simple matter to interpret 'on' and 'off' as two digits. In binary, the two digits are '0' and '1'. For higher numbers, a column to the left must be added, just as we add a 'tens' column for denary numbers above 9. In the case of binary, though, the column is a 'twos' column. With a two digit binary number, the highest value that can be represented is 3, and it is written as 11. This means that there is 1 '2' and 1 '1' – a total of three. Another column can be added to the left to give 'fours' (two twos), and a further one to give 'eights' (two times two times two).

As you can see, it takes a lot of binary digits (known as 'bits') to represent even relatively small denary numbers. In the Amiga's memory, eight binary digits are grouped together to hold the contents of each location. Consequently, numbers between 0 and 255 can be stored there, since 255 is the largest value that can be represented with eight bits.

Another number system often used in programming is hexadecimal. This is based around 16 digits – 0 to 15. Anything written in the column to the left represents the number of 'sixteens' in the number. Although the 'units' column of a hexadecimal number may hold a value higher than 9, it would be impractical to write this as an ordinary number with two digits – it would be impossible to tell whether the left-hand digit referred to 'sixteens' or whether it was part of the units. Instead, units between 10 and 15 are written as the letters A to F.

Programmers often use hexadecimal because it is a much more convenient and easier to read notation than binary, yet translation between the two is relatively simple. Here's a table comparing the binary, denary and hexadecimal notations for a set of numbers:

Comparison of denary, binary and hexadecimal numbers

DENARY	BINARY	HEXADECIMAL
0	0	0
1	1	1
2	10	2
3	11	3
4	100	4
5	101	5
6	110	6
7	111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F
16	10000	10



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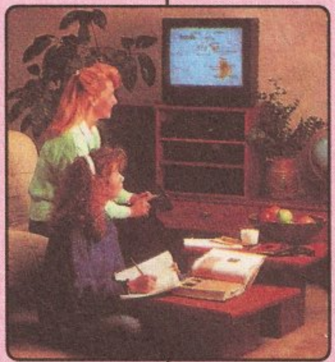
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Pretentions on the PC

The KCS Power PC board's long awaited colour EGA/VGA upgrade has finally arrived. Mark Smiddy exclusively examines a dream come true



"If you've just bought an Amiga, then you may ask why you would want to turn it into a PC. I'm explaining just what the KCS Power PC board can offer you."
Mark Smiddy

It's a sad fact that most PC emulations – and you can include machines such as ST and Archimedes – only go as far as emulating IBM's colour graphics adaptor (CGA). There's a good reason for this: the later standards EGA and VGA create a greater demand on the emulation; and therefore the machine performing it.

POWERBOARD V3

To some extent emulating some modes available on these cards is either impractical or plain impossible because of the physical resolution employed. Vortex boasted a monochrome subset of E/VGA with the last edition of ATOnce; but this proved to be more trouble than it was worth. Almost a year later, KCS has finally released a 16 colour E/VGA solution that promises to be much more compatible. (If you are not yet familiar with the KCS Power PC Board, further details are given in the Beginners Section on page 145).

The most notable change in the new software is that the board is now started from a Workbench icon and not by a direct boot disk – making hard disk installation possible. Floppy disk users have an option to convert to a bootable disk if they wish. Three versions are supplied: one for standard machines, one for machines with extra RAM and another optimised for the 68020/30 CPUs. Auto sensing installation software automatically ensures you boot with the correct one. The PC Preferences (configuration) software can now be launched from Workbench – far more friendly than the original method.

MORE MEMORY

In addition, the Amiga side of things includes another little program which creates an MS-DOS utilities disk. This obviously saves money for everyone when it comes round to sending out the updates, since only one disk has to be duplicated. The software's front end is a little crude but it works, and you only need it once. The disk created contains no less than ten utilities for use with the PC side of things – including the clock and mouse drivers, plus a 200K PC-reset proof RAM disk.

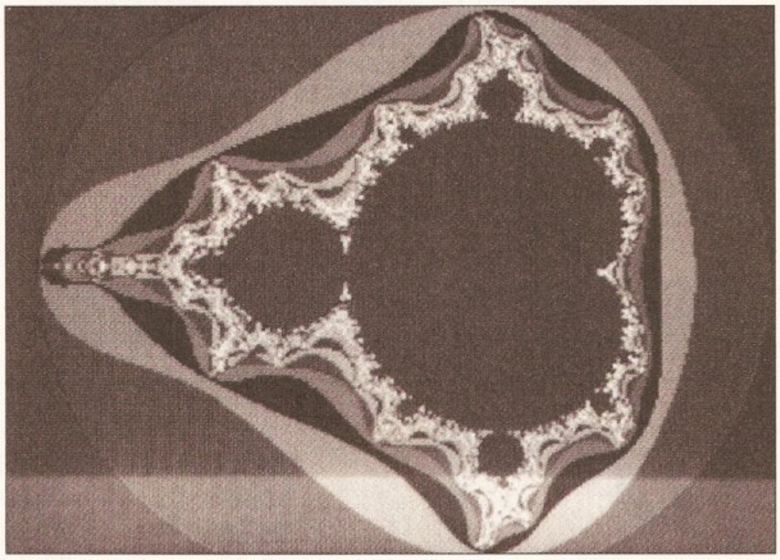
More notable though are KCSEMS.SYS and KCSXMS.SYS – two drivers for the long awaited Extended (XMS) and Expanded (EMS) memory system. In one fell swoop, these two little programs solve what some have seen as a major flaw in the original software. Practically speaking, these will allow you to access up to 16Mb extra memory in PC mode; allowing massive *Lotus 1-2-3* spreadsheets and effective use of Microsoft *Windows*. KCSXMS.SYS replaces the MS-DOS HIMEM.SYS which only works on 80286 type machines.

GRAPHICS UNLIMITED

This is the bit we have all been waiting for, the high-resolution colour graphic support in EGA and VGA. The task of emulating these modes is by no means as easy as you might think – since PCs have a wide range of graphics modes that must be catered for. ATOnce owners are stuck with mono EGA and VGA which doesn't work very well; so the acid test must be to see how well KCS has addressed the problem. The answer is well, though not perfectly.

In text modes, only the normal 25 line display is supported: there's no support for the 43 line EGA or 50 line VGA modes. Not a lot of programs actually support these, but it would be nice to have the option; although it must be said, Amiga hardware restrictions are partly to blame here. Speedwise, there is little to tell between a real XT (or an AT for that matter) and the emulator. In many tests the video BIOS is actually faster than a real PC in text mode. At this point, it's probably worth mentioning a curious new text mode

continued on page 145



Another example of the ubiquitous Mandelbrot set, this time produced by the popular PC public domain program *Fractint* in the Power PC Board's 16 colour VGA mode

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CGA – Colour Graphics Adaptor. 4 colour low-resolution graphics board.

EGA – Enhanced Graphics Adaptor. 16 colour low or medium-resolution graphics board.

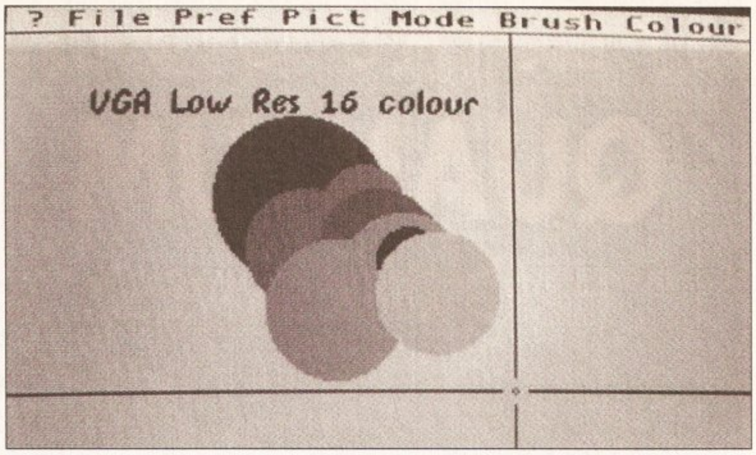
EMS – Expanded Memory System. Memory located above the normal DOS limit of 640K up to a maximum (usually) of 384K. EMS co-devised by Lotus, Intel and Microsoft (hence LIM) is a paged system, so although you can have very large amounts, only small (384K) chunks are available at any one time. How this affects you depends very much on the software.

MCGA – Multi-colour graphics adaptor. 256 colour low-resolution graphics board.

MDA – Monochrome Display Adaptor.

VGA – Video Graphics Array. 16 or 256 colour, high-resolution graphics board.

XMS – Extended Memory System. Memory located above the 1Mb limit. Used for large RAM disks usually – but only available on 386 processors and above.



No stranger to Amiga users, this is the PC version of *Deluxe Paint*, which runs at a pinch with the Power PC board emulator

continued from page 143

which allows the screen to be stretched to double its normal width. The screen displays just 40 characters, but the software thinks the screen is still 80 columns wide. A simple keypress scrolls around the display. A nice touch for the visually impaired, I feel.

FLICKER OFF

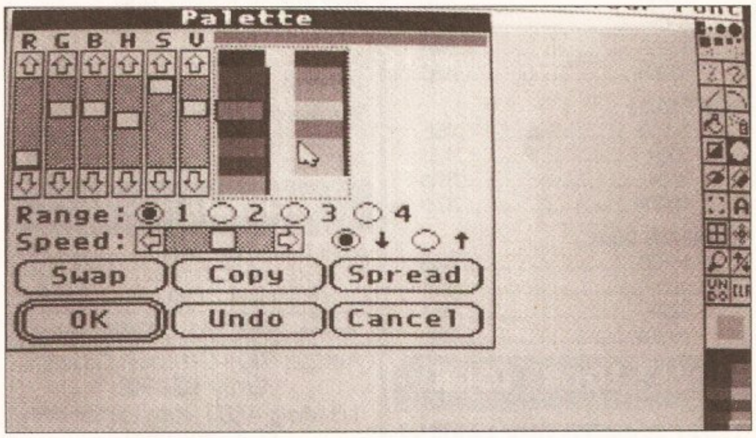
Graphics fair slightly less well. As far as I could determine, all the standard 16 colour modes are supported – some using interlace, others not; a full list appears elsewhere. However, although most programs ran perfectly under CGA, a few (notably *As-Easy-As 4*) failed to work properly, if at all, in EGA and VGA. The resultant output ranged from usable (*As-Easy-As*) to totally garbled (*Cadaver*). KCS is aware of the problems and is determined to correct them soon. Based on my previous experience, I believe the company will too. You should also note, due to the type of emulation the aspect ratio of some screen modes gets a little distorted.

Interlaced screens are used whenever the software calls for a display with more than 256 vertical lines – say 640x480 16 colour VGA mode. Interlace, and the flickering screen, is a fact of life but KCS has made things a little easier on the eye with an anti-flicker mode. In colour modes a simple keypress selects an interlaced or low-res display. The full interlaced screen is correctly drawn even when flickering is switched off. The anti-flicker for the monochrome modes is slightly more sophisticated: no less than 17 levels are available at the touch of a button.

SPEED TESTS

As I have said before, I am not a big fan of benchmark tests – because the only thing you can test with a benchmark is the benchmark test. Even the highly respected Landmark couldn't make its mind up whether the system was running like a 8MHz or 6MHz AT and the Norton index result came in at 5.1 – faster than the original version 2 software. (Those with a thirst for figures will enjoy the comprehensive list I've compiled here.) My personal preference is to test the system with the software you want to run on it, and then decide.

Text emulation is excellent, and a surprising number of PC programs – like Central Point's *PC Tools* – use nothing more than flashy text displays to achieve the desired result. These programs run without a glitch – so you can run *DBase IV*, Turbo BASIC, Pascal, C, and so on just as if they were running on a real XT. (The mouse emulation comes in surprisingly handy here; and since the Amiga already has a mouse, there's no need to rush out and buy one for the PC.)



The palette requester for *Deluxe Paint* running in 16 colour VGA mode. Again it's the PC version of the software

Graphics intensive programs are a whole new ball-game. *Deluxe Paint* runs – at a pinch, as do *GEM*, *GEOS* and *Windows*. But these systems are not really designed for XTs anyway, so you can't expect the Powerboard to make them do loop-the-loops. Games are graphics and sound intensive things too; although most will work in icky CGA (very well too, all things considered) EGA and VGA are a dead loss – so you can forget

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BEGINNERS START HERE

What is the Power PC board?

It's a 11MHz IBM PC-XT clone on a simple plug in card that fits all Amigas. 1Mb of memory is available to the PC side, 512K is added to the Amiga. A special version for the A500 Plus makes a full 1Mb available, taking the machine to 2Mb CHIP RAM; and 1Mb of FAST RAM on the A1500 and above. The BIOS is based on a ROM from Phoenix Software.

Hardware emulation includes: one serial port (COM1 or COM2); one parallel port; a mouse and joystick driver. Screen modes for Hercules monochrome, MDA, plus partial colour EGA and VGA.

So what's a PC?

A personal computer. When the PC was introduced it created a whole new market. Previously computers were massive affairs housed in purpose-built rooms. Each operator would have their own terminal (keyboard and VDU) but no access to the CPU itself.

The advent of the personal computer revolutionised all that. For the first time ever, computers became desk-sized single user affairs. Since the marketing muscle of IBM came to bear the term, PC has become synonymous with one particular breed of these machines – the IBM PC.

So what's an IBM PC?

The term PC and IBM PC are very often confused – even by the people who sell them. An Amiga is a PC, as is the Mac – they are all personal computers. Most people regard a PC as being any computer which is based around an Intel 8088 (or compatible) CPU and is capable of running a version of MS-DOS. The range starts with the 4.77MHz 8088-based systems – called as PC-XT clones – rising to the powerful 33Mhz 80486 (aka 486) systems.

Between the two extremes (rising in power) are the 8086, 80286, 80386SX, 80386DX and 80486SX – each with a variety of different clock speeds. These days, XT-type systems run at 8 or 10MHz; AT-type systems (based on an 80286 or higher) range from 8MHz to 33MHz and are getting faster all the time. As a benchmark, the 7.14MHz Motorola MC68000 found in most Amigas is roughly equivalent to a 8Mhz 80286.

What makes the IBM system clever though, is its modularity. Just about everything you add to the system is plugged into a "slot" in the motherboard. Therefore, you can change just about any aspect of the hardware by exchanging or adding a card.

I'm happy with my Amiga, what good is a PC?

The PC comes into its own when you look at business applications. It will allow you access to top-selling titles such as *Windows 3*, *Lotus 1-2-3*, *Aldus Pagemaker*, *Microsoft Word*, *DBase IV* and so on. To get the best from any of these you'll need a good graphics adaptor too. CGA is not good enough and EGA is really the minimum; and that's what makes the latest edition of the Power PC board so exciting.

What are CGA, EGA, VGA and MCGA?

CGA (colour graphics adaptor) was IBM's first attempt at a graphics card – one graphics mode (320x200) is offered in a choice of two sickly palettes. Later came EGA – this improves the situation with three 16 colour modes: 320x200, 640x200 and 640x350 with a 64 colour palette. VGA adds 640x480 to the standard EGA modes and a palette of over 260,000 colours. MCGA is the 320x200, 256 colour mode of VGA. Third party cards offer an even more bewildering variety of modes. However, it's worth mentioning that on a "real" PC these modes all fill the screen; this is not true of the current batch of emulators.

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about *Wing Commander 2*. Games players will enjoy the new features such as pause mode and speed adjustment though.

SLOT IT IN

Perhaps the Powerboard's biggest shortcoming was its inability to run in Commodore's premier machines, that is, those above the A500. This has recently been addressed in the form of a simple plug-in adaptor board. (A similar remedy to the one offered for ATOnce.) The original board simply slots into the adaptor, which in turn drops into a vacant slot in the host machine; including an A3000. Therefore, if you decide to upgrade to an A2000 machine later on, you can still enjoy the KCS emulation without having to resort to Commodore's own mediocre offerings or the ATOnce.

Interestingly enough, owners of these machines can enjoy other benefits too. Since the emulation is software based, the added speed and power of, say a 25MHz 68030, speeds up many functions. This is most noticeable in graphics modes, games such as *Flight Simulator 4* and *Lemmings*. Also, Hercules and the high-resolution E/VGA modes are flicker-free.

CONCLUSIONS

When it comes to PC emulation, the KCS card has always been the one I have unreservedly recommended: in terms of value for money, ease of use and compatibility it is still the best. Version 3 was a long time coming, but it has been worth the wait. The bugs (buggettes really) are being addressed but hardly detract from what must still be the best value-for-money upgrade for the Amiga yet devised. Hard disk owners should still check for compatibility, because although the Powerboard works with most systems it does not support every one – UK suppliers, BDL, will furnish the information at the cost of a phone call.

> **"It costs less and does many things better than the real thing."**

Existing users will probably already have their copies by the time they get to read this since KCS has agreed to send free updates to all registered users; unusually generous for a manufacturer – it's a real pity there aren't more like them. Bitcon also must be complimented on their excellent helpline service, one of the best I have come across.

The Powerboard will never replace a dedicated PC, but for occasional use you won't find a better system at the price. What next? I think everyone wants 256 colour MCGA/VGA but that's a bit of a pipe-dream given Amiga hardware. If anyone is going to crack that one, my money's on KCS. AS

Those speed comparison ratios in full

KCS Power PC board relative to:	4.77Mhz XT	8Mhz AT
RAW TEST (A500)		
Instruction Mix	2.6	0.7
128K NOP loop	3.1	1.3
Do nothing loop	2.2	0.8
Integer add	2.9	0.6
Integer multiply	4.3	0.5
Sort and move	2.8	0.7
Prime sieve	2.6	0.7
Float mix	3.4	0.7
OVERALL (mean)	3.0	0.8
ACCELERATED TEST 68030 25MHz		
Instruction Mix	2.5	0.7
128K NOP loop	3.4	1.4
Do nothing loop	2.5	0.9
Integer add	3.3	0.7
Integer multiply	5.0	0.6
Sort and move	2.8	0.7
Prime sieve	2.9	0.8
Float mix	3.4	0.7
OVERALL (mean)	3.2	0.8
ACCELERATED TEST 68030 25MHz		
DOS disk access (drive C)	5.0	1.9
File access (small records)	2.3	1.3
File access (large records)	4.1	1.7
OVERALL (mean)	3.8	1.6
RAW TEST (A500)		
Direct screen access	9.7	7.6
Bios teletype no scrolling	4.4	1.9
Bios teletype with scrolling	5.7	2.7
OVERALL (mean)	6.6	4.1
ACCELERATED TEST 68030 25MHz		
Direct screen access	11.6	9.1
Bios teletype no scrolling	8.6	3.6
Bios teletype with scrolling	23.4	11.2
OVERALL (mean)	14.5	8.0
Conventional memory read	3.2	0.7
Conventional memory write	3.2	0.7

A Guide to Video Compatibility

Mode	X x Y	Type	Results
0	40 x 25	Text	Pass
1	40 x 25	Text	Pass
2	80 x 25	Text	Pass
3	80 x 25	Text	Pass
4	320 x 200	4 colour CGA	Pass
5	320 x 200	4 colour CGA	Pass
6	640 x 200	2 colour CGA	Pass
7	80 x 25	Monochrome (Hercules)	Pass
13	320 x 200	16 colour EGA	Pass
14	640 x 200	16 colour EGA	Pass
15	640 x 350	Monochrome EGA	Pass (Interlace)
16	640 x 350	16 colour EGA	Pass (Interlace)
17	640 x 480	2 colour MCGA/VGA	Pass (Interlace)
18	640 x 480	16 colour VGA	Pass (Interlace)
19	320 x 200	256 colour MCGA/VGA	Fail
P.C.G.			Fail
Split scrn			Fail
Blinking			Fail
Highlight			Pass
Reverse			Pass
Pan test			Pass
Palette			Pass

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for board and software only.....£189.95
inc of MS-DOS & GW Basic........£219.95
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by Kolff Computer Supplies BV
Dordrecht, Holland

UK importer: Bitcon Devices Ltd,
88 Bewick Road, Gateshead,
Tyne and Wear NE8 1RS
☎ 091 490 1919

CHECKOUT
KCS Power PC Board

Stability ●●●●●
Can't find fault with it here.

Features ●●●●○
Even more options than the original.

Documentation ●●●○○
Getting better – new manual expected soon.

Compatibility ●●●○○
EGA/VGA is a little shaky in some modes.

Speed ●●●●○
Excellent, by far the fastest XT I have ever used.

Value ●●●●●
Costs less than the real thing, and does many things better.

Overall rating ●●●●○
The best PC emulator around, and it keeps getting better.

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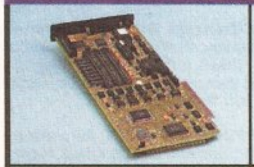
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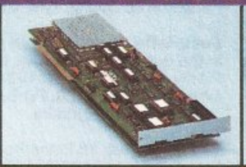


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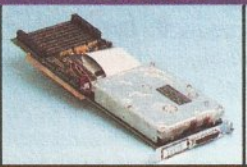


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Which computer(s), if any, do you own? 68

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Find your local group

If your group isn't mentioned, fill in the form at the bottom of the page to let us know about you

1520 Plotter Group (ICPUG) Contact John Bentley ☎ 06286 65932.

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. A club for Amiga artists, musicians and coders for mutual assistance and programming demos. Pirates not welcome. Free membership. Contact KAM on ☎ 0532 493942, 5pm-8pm.

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry, BT49 0QG. A club to help newcomers to the Amiga. Bi-monthly club disk, and a small PD library. Membership £2 for a single disk, or £20 for every issue.

Amiga Helpline Service DTP, PD, Help/problem service. Free membership. Beginners welcome. Send stamp for info to: G Keenan, 21 Skirsa Pl, Glasgow G23 5EE.

Amiga Musicians' Club Membership gets you a disk with 50 IFF samples a month for 12 months. Also sample service. Membership £30. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus.

Amiga Users' Klub, Windsor House, 19 Castle Street, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga computing and to help solve people's problems. Contact Jack Talling.

Amiga UK Newsletter offering reader to reader advice. Free ads and PD library plus DTP scanning service. Membership £10 per annum. Contact Ken Harvey, 67 Waverley Rd, South Benfleet, Essex SS7 4AX ☎ 0268 793973.

Amiga Users Group - FYLDE Advice on Amiga, technical support, discussions, workshops, tuition etc. Free membership. Contact A Wilkinson, 25 Gleneldon Rd, Lytham St Annes, Lancs ☎ 0253 724607.

Amiga Video Producers' Group Meets quarterly in Swindon. For info pack send SAE to J Strutton, 8 Rochford Cl, Grange Park, Swindon, Wilts SN5 6AB ☎ 0793 870667.

Amiga Witham Users' Group 85 Highfields Rd, Witham, Essex CM8 1LW. Distributes tips and Basic programs. Keith Anderson ☎ 0376 518271.

Amigaholics Club For beginners and some experts. Free membership. Own disk magazine. For further information contact Kevin Bryan ☎ 071-580 2000 Ext 240 or write to 29 Wolfe Crescent, Charlton, London SE7 8TS.

Amigamania Quarterly newsletter (tips, advice etc), quality PD, discount hardware, software and acccessories, free advice. Annual membership fee £7. Contact S Green, 9 St Lukes Walk, Hawkinge, Kent CT18 7EF

AMOS Programmers' Exchange Free membership. Swapping software and ideas. Help available. J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD

AMOS User Group Swap ideas, help on any AMOS subject, swap PD and own creations. Contact Andy ☎ 0323 26790

Anglesey ICPUG Meet every Monday 6pm-9pm at Holyhead Unemployed Workers Club. All machines from C64 to Amiga. Contact Nick Massey ☎ 0407 765221.

Avon Micro Computer Club Graphics and animation, business and the chance to speak to professional users. £3 per annum. Contact Roger for more information: 95 Downend Rd, Horfield, Bristol ☎ 0272 513224.

Ayr ICPUG Meets at Radix Training Centre, West Sanquhar Road, Ayr. Contact John Smith ☎ 0292 261408 Ext 202.

GET YOURSELF LISTED

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

AS11

Group name ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Place of meetings ....

....

Time of meetings ....

Type of activities ....

....

....

Membership fee ....

Basic Programmers' Group 68 Queen Elizabeth Drive, Normanton, West Yorkshire WF6 1JF. Encourages the use of Basic, exchanges ideas and assists beginners to the language. Free newsletter from Mark Blackall ☎ 0924 892106.

Bury St. Edmunds ICPUG Contact Alan Morris ☎ 0359 51446.

Buxton ICPUG Contact Peter Richards on ☎ 0298 23644.

CanDo User Group Interested in helping start a group to swap applications, hints, via disk, newsletter and occasional meetings send SAE to J Ransley, 3 Berry Close, Telscombe Cliffs, Peacehaven, E Sussex BN10 7DW.

Champion PD Club PD at 30p, newsletters, advice, help and more. Membership £10. Contact: Steve Pickett, 31 Somerset Close, Catterick, N Yorkshire, DL9 3HE.

Chester-le-Street 16-Bit Computer Club Ground floor function suite, The Civic Centre, Newcastle Road, Chester-le-Street. Club meets Mondays from 7.30-9.30pm to look at software, exchange advice and swap tips. Contact Peter Mears ☎ 091-385 2939.

CDTV Users Club Exchanging views on software and hardware. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES.

Chic Computer Club Full details with an SAE to STAMP, Chic Computer Club, PO Box 121, Gerrards Cross, Bucks. Contact Steve Winter ☎ 0753 884473.

Club Amiga Membership of this national group costs £10 a year for PD software and a 24-hr telephone helpline service (091-385 2627). For more information send an SAE to Chris Longley, 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear.

Comp-U-Pal Australian user group for users in the outback. Newsletter, phone helpline, PD library. Membership A$24. Write to Comp-U-Pal, c/o MDA, PO Box 29, Knoxfield 3180, Victoria, Australia.

Computer Club 16 Laton Road, Hastings, East Sussex ☎ 0424 421480. A 16-bit club dedicated to being computer enthusiasts without being pirates. Membership costs £15 per year, and the club has discounts with several local firms.

Coventry ICPUG Meets on the first Wednesday of the month. Bring your computers. Contact John Orange ☎ 0203 689635.

Disabled Group (ICPUG) Contact David Bate, 71 Bedford Road, Bootle, Merseyside L20 7DN.

Dublin ICPUG Meets fortnightly on Fridays (except August) at St Andrews College. Covers all Eire, 36-page newsletter. Discounts arranged. Contact Geoffrey Reeves ☎ 010 353 12 883863.

Durham PD Club Free PD, help with Amos or general problems. Membership £12 for 6 months. Contact Scott Harvey, 68 Wood Vue, Spennymoor, Co Durham DL16 6RF

Edinburgh Amiga Group Membership £5, includes free advice and PD. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE with SAE.

Edinburgh ICPUG Contact Martin Lowe, Amiga Centre Scotland ☎ 031-557 4242.

Hereford Amiga Group Membership free, help for beginners, exchange of PD and shareware. Linked Amiga stunt car racer championship. For more details contact John Macdonald, Alma Cottage, Allensmore, Hereford HR2 9AT ☎ 0981 214 14.

Imagine Users' Group To encourage use of Imagine and other ray tracers. Affiliated to US group. Object library. Membership free. Contact Brian Walker, 16 Cambridge Road, Newton Cambridge CB2 5PL.

Independent Commodore Products Users' Group Biggin Hill Library, Church Road, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. There are lecture nights and open nights where members can get help. See also regional entries. Contact John Bickerstaff after 8.30pm ☎ 081-651 5436.

Kent Youth Computer Group Computer fair visits, programming, video and DTP work, monthly newsletter. 30p entry/evening. Meetings Sundays 6.30 - 9pm at the D Bowen Youth centre, Kingsnorth Road, Ashford, Kent TN23 2LY. ☎ 0233 629804

Macclesfield ICPUG Meets at The Harlequin Club, Chestergate, Macclesfield, every Tuesday from 8-11pm. Contact Peter Richardson ☎ 0298 23644.

Mid-Thames ICPUG Meets at Cox Green Community Centre, SW of Maidenhead, on the second Thursday of the month at 7.30. Open nights and some talks. Newsletter. Contact Mike Hatt ☎ 0753 645728.

Northern Ireland Amiga User Newsletter, free PD library. Send SAE for further info. £5 annual membership. Contact: S Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS

Pennine Amiga Club 26 Spencer Street, Keighley, West Yorkshire BD21 2BU. Offers free membership, free advice, and circulates a newsletter. Contact Neville Armstrong ☎ 0535 609263.

Public Domain User Group Swaps PD between members, provides advice and reviews of PD. Basic membership free, advanced £3 per year for newsletters and price reductions. SAE to 12 Oxford Road, Guildford, Surrey GU1 3RP.

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Meets on the last Thursday of the month. PD library, bulletin board, advice from Amiga experts. Contact Philip Worrel.

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. Offers a forum for exchanging old, unwanted games for a small price. Contact Michael Pun ☎ 021-459 7576.

Solent ICPUG Meets at GEC Aerospace Sports and Social Club, Titchfield, Hants, first Tuesday of the month at 7.30. Contact Anthony Dimmer ☎ 0705 254969.

South West ICPUG Meets second Sunday of the month at Queens Arms Hotel, Charmouth, Dorset, at 10am. Bring your computers. Some talks. Contact P Miles ☎ 0297 60339.

Stevenage ICPUG Meets at Hertford Road Community Centre, Stevenage, last Friday of the month at 7.30pm. Contact Bob Grainger ☎ 0438 727925.

Watford ICPUG Long-standing club with friendly atmosphere. Meets third Wednesday of the month, 7.30pm St Thomas Church Hall, Watford. Membership £15. Contact Mark Pryor ☎ 0442 864234.

WCSPSA! Help available. PD disk of your choice and newsletter every month. PD at £1. Membership fee £25. For information contact A Jamieson ☎ 0749 677609

West Riding ICPUG Meets at the White Horse Inn, Fall Lane, East Ardsley, Wakefield, first and third Tuesdays at 7pm. Open nights. Minibus to London shows. Contact Kevin Morton ☎ 0532 537318.

Wigan ICPUG Contact Brian Caswell ☎ 0942 213402.

Wrexham District Computer Club PD, library of books, equipment loan. 10p to join, plus 50p to get in. Held in Memorial Hall, Wrexham every Thursday, 7-10pm. Contact Paul Evans, 3 Ffordd Elfed, Rhosnesi, Wrexham, Clwyd LL12 7LU.

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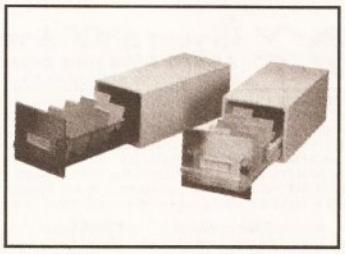
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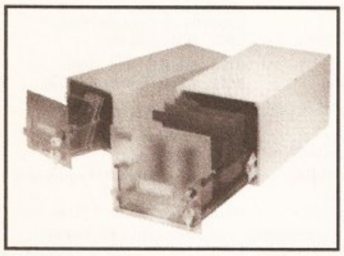
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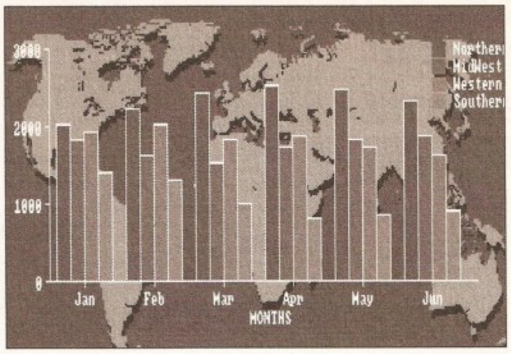
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Spreadsheets like *Advantage* have offered graphing functions for years, but *Bars&Graphs* is the first dedicated graphing program for the Amiga. Is it any good?

Most of us associate charts and graphs with school mathematics lessons, but they can also be jolly useful things if you use your Amiga for any one of the many forms of computerised presentation. Whether you're a whiz with a genlock, a master of DTP or a high-flyer in business presentation, being able to get complex statistical information across to your given audience is an art form that few have mastered.

Drawing up a decent graph is easy using a program like *DPaint*, but it's hardly the most enjoyable task at the best of times. What's more, if you're dealing with a complex set of numbers, hand-drawn graphs have a habit of being imprecise. This is where *Charts&Graphs* comes in. It's dedicated to producing attractive charts and graphs in different formats. It does most of the work for you, so put away *DPaint* now!

TECHIE TWADDLE

I'm one of those people who likes to dive straight in and get started with a program, but soon discovered I'd have to sit down with the 230 page manual to see anything even slightly resembling a graph on my screen. I'm not calling it unfriendly, but it's hardly the easiest program to use.

The *Charts&Graphs* manual has one major problem – it was written by the programmer. On the whole he does a good job of explaining the program's operation, but he manages to fall into the trap that most programmers do – namely, techie twaddle. We all like to know a little about how programs work, but I hardly think that most users want to know the reasoning behind the programmer's decision to use PUBLIC memory instead of CHIP RAM for the requesters!

Thankfully he does include a couple of tutorials which take you through the process of creating charts. It really is worth following these tutorials before you go it alone. By the time you've worked through them, you should have grasped the majority of the features!

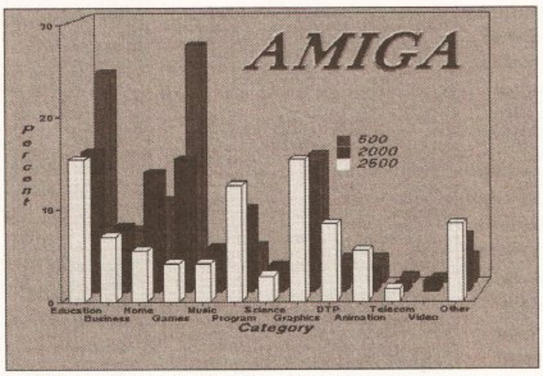
SPREADING IT ABOUT

When *Charts&Graphs* loads, you're presented with a screen with more than a passing resemblance to a spreadsheet. It doesn't have all the high power number-crunching features you'd expect in a spreadsheet, but the spreadsheet way of working has been brought across. It's a sensible move – after all, most computer users should have a basic knowledge of spreadsheets, so it should be fairly simple to use.

Like a real spreadsheet, your graph data is entered into *Charts&Graphs* by typing each set of numbers into their own columns. You're not restricted to a single set of graph data, so if you're feeling extravagant, you can let your imagination run wild. Bar some pretty basic addition and subtraction facilities, *Charts&Graph*'s spreadsheet interface is a little lacking in features – It would have been nice to have a few of the more basic spreadsheet functions on tap.

CRASH AND SPURN

Once your data is entered, you must save your chart data off to disk. *Charts&Graphs* managed to crash on me more than a couple of times, so I wouldn't trust it with anything more than the simplest of graphs – there's nothing more frustrating than having to type in numbers from scratch (it's bad enough the first time!).



With a single click of the mouse, your graphs can be brought into the third dimension

Selecting 'Graph' from the pulldown menus takes you into the *Charts&Graphs* graphing module – the part of the program which does all the hard work. At the simplest level, there are 19 types of graph to choose from – four line charts, six column charts, five bar charts and four pie charts. Selecting one brings up a requester which asks you which of the columns of data you created earlier is to be used for labelling and which are to be graphed. Once you've told it this, *Charts&Graphs* puts its thinking cap on and after a few seconds your chart is displayed onscreen in all its pixelised glory.

If you're not quite happy with the appearance of your graph, *Charts&Graphs* gives you extensive control over its appearance. These controls range from the tweaking of the colour palette, right up to 3D extrusion and the inclusion of IFF clip art. Indeed, IFF support is one factor that makes the program shine – a backdrop created in a paint package can be draped behind your graph by loading a complete image whilst individual IFF brushes can be loaded and used as the rendering graphic for bar and column charts.

POSTSCRIPT POWER

Charts&Graphs is a pretty well endowed program when it comes to saving and printing graphs. You can save your graph either as a standard IFF image (handy for other presentation programs) or even as a Postscript file for inclusion within DTP programs like *ProPage*.

Postscript support is extended to printing, allowing you to dump your graph out to anything from a Laser to an Imagesetter with the graph being printed at the highest resolution of your printer. For those of you with slightly more humble printers, *Charts&Graphs* also supports the usual preference printers.

CONCLUSION

Charts&Graphs is the work of a single programmer and it shows. It can produce impressive results, but lacks the professionalism that should separate it from other graphing programs. The programmer seems to have spent too much time making the requesters look pretty rather than making the program smoother in operation.

It is hindered by its ability to crash when least expected. I thought this might be a problem with my machine, but it continued to crash on two other Amigas – unacceptable when you're paying £50!

Charts&Graphs has potential, but this release fails to realise it. You're probably better off paying for something like *Advantage*. AS

SHOPPING LIST

Charts & Graphs £49.95
by TRSL, PO Box 94263,
Las Vegas,
Nevada 89193-4263
USA

CHECKOUT CHARTS & GRAPHS

Features ●●●●○
Despite crashes and a slow user interface, a wealth of graphing functions.

Ease of Use ●●●○○
Getting used to the program takes some time, but perseverance can reap rewards.

Documentation ●●●●○
Apart from the occasional techie twiddle, the manual is actually very well written.

Speed ●●○○○
Chugs along at an acceptable pace, but start to throw complex data at it and things can slow down considerably.

Price Value ●●○○○
Cheap for a commercial product, but still very rough around the edges.

Overall rating ●●●○○

Locked away by some lousy programming is a gem of a program – it's a shame that the damned thing keeps crashing!

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❑ **V048 TV & VIDEO GRAPHICS (8)** Packed with background screens for your video productions, Different types of graphic styles, **Peel** takes an IFF Picture and peels it down the screen, & more.
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MORE UTILITIES

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❑ **V443 SPECTRUM EMULATOR V1.2 By KGB** Various new features but the main updated feature is that it now has sound ability.
❑ **V444 PRINTER DRIVER UPDATE DISK III** Another update to our printer driver collection. now contains instructionon how to install them.
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❑ **AT34 LEAVING SPACE OFFICE** Animation , **DOCKING** Animation from star trek. **ATTACK MODE** Bird of Prey Scout hip in attack mode
❑ **1060 STAR TREK THE NEXT GENERATION** This game is by Terry A. Mc Intosh. v1.47 *
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❑ **1696** The Star Trek trivia quiz game
❑ **2031 STAR DREK MUSIC (2)**
❑ **2033 STAR TREK MEGA DEMO (2)** T.Richter presents a Mega demo of Star Trek pictures.
❑ **SMAUG120** The Star Trek the game by Eric Gustafson US Inport reqires 1Mb and (2) disks
❑ **SMAUG156** The Star Trek the game by Jimbo Barbers American version 1Mb and (3) disks
❑ **AMUSE19 TREK73** A strek trek Battle Simul-ator where you can attack klingons & Romulans
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❑ **1561 TRITWIS** This is the best version of Tetris on the amiga with a 3 play option.
❑ **1664 THE CASTLE ADVENTURE** Excellent new Text adventure simular to the infocom
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❑ **1735 ASTERIODS** 'THE ORIGINAL' Another old classic. Remember that Classic.
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❑ **1984 AIR WARRIOR** The first real flight simul-ator on the amiga with various Air planes to Fly
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Prints Charming

If the quality of your printouts isn't up to scratch, then Turbo Print Professional could be for you. Jason Holborn wasted lots of paper trying it out





The quality of *TurboPrint* is more than obvious – just compare these two grabs. The top one was produced using the standard Workbench drivers and the bottom one was printed using *TurboPrint*

The Amiga's printer drivers are good as they stand, but I've always suspected that there was still room for improvement. IrseeSoft's *TurboPrint Professional* claims to do the job, but is it any good? Let's find out....

If there's one aspect of the Amiga which causes frustration, it must be getting it to work with printers. Even once you've convinced the Amiga that it ought to talk to your printer, the results are often disappointing, to say the least.

TurboPrint Professional may be able to help you put. It is a vastly enhanced version of Irsee's *TurboPrint* utility, launched about 4 years ago, which never really achieved the recognition it deserved due to some rather lousy marketing this side of the Channel. Thankfully IrseeSoft has got its corporate act together and *TurboPrint Pro* is the result – the packing is slicker, the manual is more readable and the program's not bad either!

PROTECTION RACKET

TurboPrint can be installed on both hard disks and boot disks, but there's one major problem that proves to be a real pain – it's copy protected. Each time you run the program in a fresh machine, *TurboPrint* asks you to insert the original disk. If it likes what it finds, then it'll continue but if your original becomes corrupt, you're stuck. Thankfully this only has to be done once every time the machine is switched on, so it's not a problem if you use your Amiga for long periods.

Getting *TurboPrint* up and running isn't that complex once you've fought your way through the strange English translation of what was a German manual. Things are helped along by a well designed Preferences-like program called TurboPrefs which allows you to carry out printer related tasks like telling *TurboPrint* which printer you have and so on. There's a wide selection of printer drivers bundled with *TurboPrint* including drivers for Panasonic, Epson, Seikosha, NEC and Brother printers. The TurboPrefs program is split into four subsections. There's a page set aside specifically for *TurboPrint*'s extensive colour correction options, one for the print mode (B&W, grey scale, colour etc), another printer drivers, density etc plus a fourth screen which handles *TurboPrint*'s Poster and Hard Copy options (more on these later).

One aspect of *TurboPrint* which is particularly powerful is the control it gives you over the dithering pattern used in screen dumps. There is a total of 12, ranging from the pattern used by the Workbench drivers to some more elaborate patterns such as vertical and diagonal lines, dots of varying sizes (a bit like the pattern used in newspaper print) and the usual Floyd-Steinberg dither modes.

LOOPY PRINTS

The first thing you'll want to do once *TurboPrint* has been installed is to print something. Due to the design *TurboPrint* should work with all software without you having to inform the software of its existence. I tested it with a selection of titles and this claim certainly seems to be true.

The name *TurboPrint* is a little confusing. With the word 'Turbo' in it, you'd expect a speed improvement, but this didn't seem to be the case. The difference between the standard drivers and *TurboPrint*'s wasn't really worth writing home about. The only real difference you'll notice is in quality – and what a difference! Having suffered the standard drivers for years, I was surprised by the increase in print quality I obtained.

HOT STUFF

TurboPrint isn't one of those programs that just replaces the systems software and nothing more – it does actually give you a few extra facilities. These are accessed via 'hot keys' (pressing a combination of keys simultaneously) and can be used within just about any program. There are four of these: hardcopy screen, hardcopy area, save screen and save area.

The two hardcopy options enable you to immediately dump just about any screen that was opened under Intuition to your printer. Hardcopy area enables you to specify which part of the screen is to be printed by enclosing it in a rectangle. The two save options do the same job but the results are saved as IFF files.

Finally we have poster mode. This enables you to print any screen across several sheets of paper which can be joined together afterwards to form a massive poster with a maximum size of 8 by 7 sheets of A4. I couldn't quite face waiting for 56 sheets to churn out of my printer, but I did try it with a poster size of 2 by 2 sheets and the results were impressive.

CONCLUSION

Well, I'm a convert. *TurboPrint* hasn't increased printing speed but the difference in quality is unbelievable.

If you use your printer just for letters, there's no point in buying *TurboPrint*. It's really geared towards the printing of pictures, which it does very well. If you think your output could be improved upon, rush out and buy it now. AS

SHOPPING LIST

TurboPrint Professional £49.95
by IrseeSoft, Am Schlachtbichel 1
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CHECKOUT TURBOPRINT PRO

Features ●●●●●
Print quality plus a poster module, hardcopy options and even an IFF screen grabber! What more could you ask for?

Ease of Use ●●●●○
TurboPrint is completely transparent!

Documentation ●●●●○
The translation's a bit dodgy at times, but the manual *is* comprehensive.

Print Quality ●●●●○
Even on my naff 24-pin, the results I obtained were quite simply astounding.

Speed ●●●○○
Printing certainly isn't any faster under *TurboPrint*, but then it isn't slower either!

Overall rating ●●●●○

A must for anyone who uses their printer for graphics. Miss it at your peril.

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U4001 Graphs (P) (Several programs to produce + print graphs)
U4002 Cross (P) (Good crossword maker)
U4003 Drawmap V3.1 (Latest version, save and print maps)

GAMES - (*=1MEG)
G6012 Backgammon (P) (Great version of a great game)
G6013 Chess Tutor (P) (Improve your skill)
G6014 Ultimate Card Games (P) (Cribbage, Hearts, Bluemoon, Patience and Solitaire)
G6015 Super Skoda Challenge (P) (New car race game)
G6017 Star Trek Next Generation (P) (Strategy Game)
G6018 Dominos and Connect 4 (P) (Good versions of the originals)
G6019 A500+ Games (P) (21 Games for the Plus!)
G677 Amigoids (The best Asteroids Game) (P)
G625 Drip! (*) (You must get this classic game!) (P)
G624 Blizzard (*) (PD's best shoot em up) (P)
G689 Pom Pom Gunner V2 (Latest - New levels)

CHILDRENS
C701 Learn + Play (2 disks-super education for 4-10yrs) (P)
C704 Simon Says/Space Maths (P)
C705 Treasure Island X marks the spot - with speech!)
C706 Snakes + Ladders (Classic board game fun)
C707 Pair It (*) (Match the cards-great fun!) (P)
C708 Crossfire (*) (Hectic arcade game) (P)
C709 Pixie Kingdom (2 disks - save the pixies) (P)
C710 Numbler Fumbler (sliding block puzzle) (P)
C712 Colour Pad (New colouring book for youngsters) (P)
C713 Peters Quest (P) (Lots of fun platform game)
C714 StorylandII (Brilliant kids game)

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117	MONOPOLY (NP)	popular old board game
135	CARD & BOARD GAMES (NP)	Cluedo + solitaire games
138	PACMAN (P)	old but addictive!
195	ELECTRIC TRAIN SET (NP)	for when the kids are asleep!
315	RETURN TO EARTH (P)	"Elite" type space trading game
496	HOLY GRAIL * (NP)	excellent text adventure
648	STAR TREK (USA) (2) * (NP)	graphic adventure
680	LEARN & PLAY (2)(P)	maths, words and colouring for kids
727	RICHTER'S STAR TREK (2)(P)	best version to date
766	TREASURE HUNT (NP)	pirate treasure map game for kids
957	PIPELINE (P)	assemble your pipe quickly to keep the oil flowing
962	DRIP! (P)	rust the pipes, avoid the nasties arcade game
987	SNAKEPIT (P)	eat the food in the maze without eating yourself
991	JEOPARD * (P)	2 player game of world conquest
1004	GAMES DISK 9 (P)	including Tetrix Metallica!
1113	WET BEAVER GAMES (P)	funny demo plus arcade Ping Pong
1230	DRAGON CAVE (P)	Sokoban type game with excellent gfx
1245	RINGS OF ZON * (NP)	arcade RPG game
1411	ARCADIA (P)	excellent breakout game
1520	BALLOONACY * (P)	bomb the buildings & land your balloon
1539	MEGABALL (P)	the best breakout game around!
1544	SEVEN TILES (NP)	futuristic football game like Speedball
1577	FRUIT MACHINE * (NP)	best fruit machine simulator bar none!
1584	MISSILE COMMAND (NP)	stop missiles destroying your cities
1591	QUIZ MASTER * (NP)	excellent trivia game
1670	WHEEL OF FORTUNE (P)	based on the TV show
1700	TERROR LINER II (X)(P)	adults only arcade game!
1711	MENTAL IMAGE GAMES DISK (NP)	3 brill games on one disk!
1715	FRANTIC FREDDIE (NP)	C64 favourite platforms & ladders
1720	CABARET ASTEROIDS (NP)	faithful version of the classic
1746	WORD GAMES VOLUME 1 * (P)	exercise the grey matter
1747	WORD GAMES VOLUME 2 * (P)	and not the joystick!
1748	STRATEGY GAMES * (NP)	serious stuff including Sea Lance
1749	TRUCKIN' (2)(2D)(P)	run your own trucking company
1832	POM POM GUNNER *(P)	WW2 arcade action - our No.1 game
1879	SEA LANCE * (P)	Trident submarine simulation
1882	SIMPSONS GAME (P)	help Bart in this S.E.U.C.K. game
1883	BIONIX II * (P)	never-ending shoot 'em up!
1905	J NICKLAUS COURSES 1	data disk only!
1916	AIR ACE II (P)	excellent WW1 shoot 'em up
1926	NAPOLEONIC WARFARE SYSTEM * (P)	war game umpire
2011	TWINTRIS * (NP)	1 or 2 player Tetris clone - very good!
2013	ZEUS (P)	simple but addictive puzzle game
2016	DOWNHILL CHALLENGE (NP)	fun on the ski slopes
2018	WIZZY'S QUEST* (NP)	wizard fun! excellent game!
2049	MATHS DRILL (NP)	maths exerciser for all ages
2050	INSIDERS CLUB * (NP)	good stock exchange simulation
2051	ATIC ATAC * (NP)	explore and collect arcade game
2052	SHAPES (P)	addictive puzzle fun!
2057	BATTLE PONG * (NP)	1 or 2 player arcade classic
2155	GHOST SHIP (NP)	3D arcade adventure

DEMOS AND ANIMATIONS

747	POPEYE MEETS THE BEACHBOYS (P)	very funny!
773	SHARK ANIMATION * (NP)	deadly ray-tracing!
825	BUDBRAIN 1 (2)(X)(NP)	great 2 disk demo + naughty bits!
895	A TRIP TO MARS (NP)	demo with a difference
906	MADONNA CARTOON ANIM *(NP)	short digitised animation
935	MADONNA : HANKY PANKY (P)	excellent Madonna sample
1033	AT THE MOVIES ** (NP)	loves of a squirrel?
1188	FILLET THE FISH (P)	funny cartoon
1229	BUDBRAIN 2 (NP)	good as the first one? you judge!
1238	EVIL DEAD DEMO (X) * (NP)	get them before they get you!
1453	MORE AEROTOONS * (P)	3 Schwartz classics
1540	AMY .VS. WALKER ANIM * (NP)	Eric Schwartz at his best!
1541	BATMAN ANIMATION * (P)	funny Schwartz animation
1552	MAGICIAN ANIMATION 2 * (P)	simply magic!
1560	PHENOMENA ENIGMA * (P)	superb gfx and music
1628	DO THE BART, MAN * (NP)	a must for all Simpsons fans!
1701	TRON ANIMATION (2) * (P)	based on the film
1707	DECAY : SIMPSONS DEMO * (P)	should appeal to everyone
1753	LIFE OF BRIAN (2) (P)	sample from the film
1841	ANTI LEMMIN' DEMO (2)(NP) **	for Lemmings fans with 2 meg
1850	THE WALL (6)(2D)(NP) *	mammoth Pink Floyd six disker!
1856	BETTY BOO ANIM / SLIDESHOW (P)	doing the Amiga
1885	ROBOCOP ANIMATION * (P)	digitised from the film
1900	SILENTS : ICE DEMO (NP)	superb music and graphics
1902	VIRTUAL WORLD * (NP)	3D filled vector demo
1943	WINDSURFER ANIMATION (2)(P) *	very good
1947	MR POTATO HEAD (P)*	funny cartoon antics
1948	MR POTATO HEAD CHIPS ARE UP! (P)*	more adventures
1956	CREATURE COMFORTS DEMO (NP)	from the TV adverts
1982	3D PINBALL ANIMATION * (P)	beautiful ray-tracing

AMIGA A500 PLUS

certain software will not work on the new Amiga. We are compiling a list of compatible titles, but this will take some time to complete. In the meantime, problems can only be checked as they occur.

USEFUL UTILITIES

81	UEDIT W/PROCESSOR (NP)	1545	SPECTRAPAINT V3.0
119	AMIGA MCAD (P)	1550	FLEXY-BASE V2.0 (P)
410	DPAINT CARTOON BRUSHES	1569	LANGUAGE TUTOR (NP)
442	DPAINT FONTS DISKS (4)(P)	1606	DATABASE MASTER 2.0 (NP)
458	HAM RADIO UTILITIES (5)(NP)	1629	SPECTRUM EMULATOR(NP)
571	JAZZBENCH (NP)	1663	DYNAMITE BRUSH FONTS (P)
580	DOPE INTRO MAKER (NP)	1858	202 UTILITIES (NP)
591	BUSINESS CARD MAKER (P)	1878	TEXTPLUS WORD PROC. (P)
632	MSH (MESSYDOS) (NP)	1880	DCOPY & UTILITIES (P)
642	C MANUAL	1884	EQUINOX INTRO WRITER*(NP)
661	PROGRAMMING DISK 1 (NP)	1886	MED V3.10 (P)
682	SOUND APPS. (2)(NP)	1893	DICE V2.06A (NP)
684	VIDEO APPLICATIONS (2)(P)	1896	DESK BENCH (3) (NP)
901	THE COMMS DISK (NP)	1906	PAGESETTER CLIP ART (8)(P)
1022	AMOS UPDATE 1.32 (P)	1914	SLIDESHOW CONSTRUC.(NP)
1095	DATABASE WORKSHOP(2)(P)	1942	MASTER VIRUS KILLER 2.2(P)
1097	DPAINT CLIP ART (2)(P)	1951	KING JAMES BIBLE (3)(P)
1099	VIDEO GRAPHICS (4)	1954	CELTICS DEMO MAKER(NP)
1117	GENEAOLOGY * (P)	1960	RSI DEMO MAKER (ENG.)(NP)
1228	ST EMULATOR (GERM.)(NP)	1961	RSI DM UTILITIES/HELP (NP)
1234	TETRA-COPY (P)	1962	TSB 3D VECTOR DESIGN.(NP)
1273	C-LIGHT (P)	1987	QUICKBENCH *(NP)
1450	NEW SUPERKILLERS (P)	1990	NIGHTFLYERS UTILS. IV(NP)
1451	ELECTROCAD V1.4 DEMO (P)	2004	TURBO IMPLODER V4.0 (P)
1452	AMIBASE (P)	2012	DRAW MAP V2.3D (P)
1536	NORTH C (PACKED) (NP)	2058	VECTOR BALL EDITOR * (NP)
1537	NORTH C (UNPACKED)(2)(NP)	2156	CODERS UTILITY DISK (P)

MUSIC DISKS / SLIDESHOWS

MUSIC DISKS		SLIDESHOWS	
81	J M JARRE - DEFINITIVE (P)	282	FORGOTTEN REALMS (P)
407	CD PLAYER DEMO * (P)	617	NEIGHBOURS SLIDESHOW
713	FLASH! - QUEEN (2) (P)	725	DIGGY PIGGIES (2)(NP)
724	TECHNOTRONIC REMIX (P)	742	MADONNA SLIDESHOW (P)
746	CRUSADERS BACTERIA (P)	814	VIZ SLIDESHOW (P)
941	S/TRACKER JUKEBOX (NP)	891	CREEPSHOW (P)
976	SCOOPEX BEAST SONIX(NP)	899	MADONNA S/SHOW 2 (2) *(NP)
1026	DIGITAL CONCERT VI(NP)	968	GOREZONE S/SHOW (X)(P)
1292	CRUSADERS : GENESIS(NP)	1051	TOTAL RECALL S/SHOW(NP)
1685	DEPECHE MODE MUSIC (P)	1085	COMIC SLIDESHOW (X)(NP)
1694	ART OF MED MUSIC DISK	1103	SPORTS ILLUST. GIRLS (P)
1695	SEAL CRAZY REMIX * (NP)	1263	RICHTER S/SHOW (2)(2D)(P)
1713	SPACED OUT VOLUME 1	1277	DIVINE VISIONS (2) *(NP)
1714	SPACED OUT VOLUME 2 (P)	1279	FORGOTTEN REALMS '90 (P)
1716	I THINK WE'RE ALONE (P)	1708	INVISIBLE WORLD (P)
1717	EVERYBODY DANCE NOW(P)	1719	YABBA DABBA CARTOONS (P)
1718	DOING THE DO(P)	1781	REFLECTIONS (NP)
1755	AMAZING TUNES 2 (3) *(NP)	1835	NIGHTBREED SLIDESHOW (P)
1993	CATS SING KYLIE! (NP)	1876	REFLECTIONS 6 (P)
2006	SAMPLE SENSATIONS * (NP)	1901	LEEDS UNITED S/SHOW (P)
2008	MOVE ANY MOUNTAIN * (P)	1919	DEBBIE HARRY (2)(2D) * (NP)
2059	VIVALDI 4 SEASONS (2) * (P)	1984	TERMINATOR S/SHOW(NP)
2159	CHARLY (P)	1986	ALIENS SLIDESHOW (NP)
2160	WHAT CAN U DO FOR ME?(P)	1991	AQUARIUS IMAGES (P)

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(P) = A500 Plus Compatible
(NP) = Not A500 Plus Compatible

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Fishing for Compliments

> "There's loads of PD and shareware available for the Amiga – it's my job to find the best available."
>
> Ian Wrigley

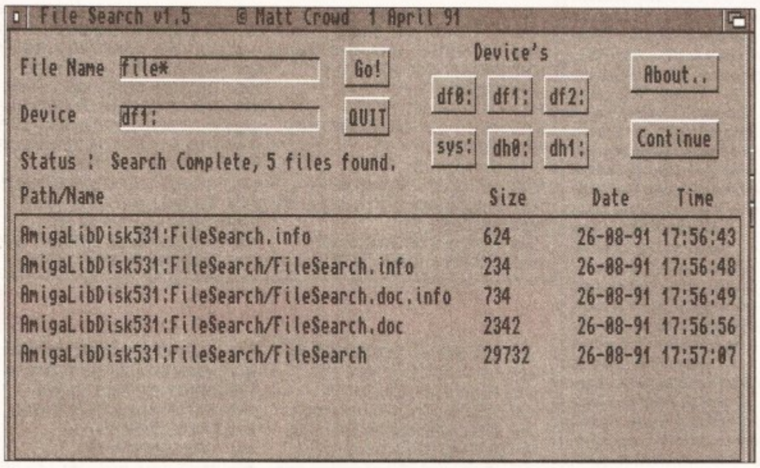
Ian Wrigley goes in search of more perfect PD, superb shareware... and fish?

This month, I'm mainly looking at programs available on recent Fred Fish disks. So rather than giving a 'value for money', I rate the individual program. You'll see from the table, which is on page 165, exactly which disks the programs are on – sometimes more than one reviewed program is from the same disk.

If you have access to a modem, many of the programs are available from bulletin boards such as CIX; if you don't, then the easiest way to get hold of the latest version of a program is to buy the Fish disk in question.

Often PD houses take the programs from the Fish disks and collect them into sets – for example, programmers' utilities, or 'business productivity packs' or whatever. However, it takes a little while for updates of programs to get to these collections, so your surest way of making sure that you have the latest version is to buy the Fish disk.

All the Fish disks mentioned this month were supplied by Unique Computing, which claims to be one of the most up-to-date sources of Fish disks in this country.



If you can never find the file you've been looking for, *Filesearch* may be the answer to all your problems. Be warned though – it's not exactly the fastest program in the world...

BEGINNERS START HERE

What are PD and shareware?

PD stands for public domain, and is a term used to describe software which – quite simply – you don't have to pay for. It's free.

The only money you'll need to pay is to a 'PD house' which duplicates the disks and sends them to you.

Shareware is similar, except that if you like a program you are asked to send the author a fee for using it – normally around $15-$25.

It's a sort of 'try before you buy' scheme. If you don't like the program, you just delete it and you don't have to pay the author anything at all.

So where exactly can I get hold of this stuff?

PD and shareware is known as 'freely distributable software' – so if your mate's got a PD or shareware program that you like, you can just take a copy of his. Don't forget to send the author his fee if it's shareware, though. You can also get freely distributable software from 'PD houses', which make a small charge for duplicating disks. There's a list at the end of this article, and loads of adverts dotted about the magazine. Finally, if you've got a modem you'll find lots of PD and shareware on bulletin boards. And it won't cost you a penny to obtain (other than your phone bill, of course).

FILESEARCH

Fish disk 531

This program, written by Matthew Crowd, is public domain. It enables a user to search any mounted volume – ram:, rad:, df0:, dh1: or whatever – for a specified filename. Although Amiga wildcards are not supported, the MS-DOS '*' wildcard is ('*' is the equivalent of '#?' on the Amiga).

Filesearch can be launched from the Shell or directly from the Workbench, and presents a simple requester which asks for the filename (a '*' wildcard is already in place when the requester appears) and for the device to search – the program defaults to dh0: when launched, but there are buttons for a number of frequently-used devices. Hitting the 'GO!' button sends the program off to search for files – and that's where the only problem appears. It's sloooow. OK, not as slow as searching through a 52Mb hard disk 'by hand', but even so you could take a few turns around the room before the program comes up with the goods.

Another criticism is that after *Filesearch* has found eight files which match the search criteria, it pauses and waits for you to hit the 'continue' button before it finds the next eight – wiping the first eight from the screen as it does so. What's wrong with the system found on a number of other computers, like the Mac, where the files are listed in a scrolling window which can be perused at leisure?

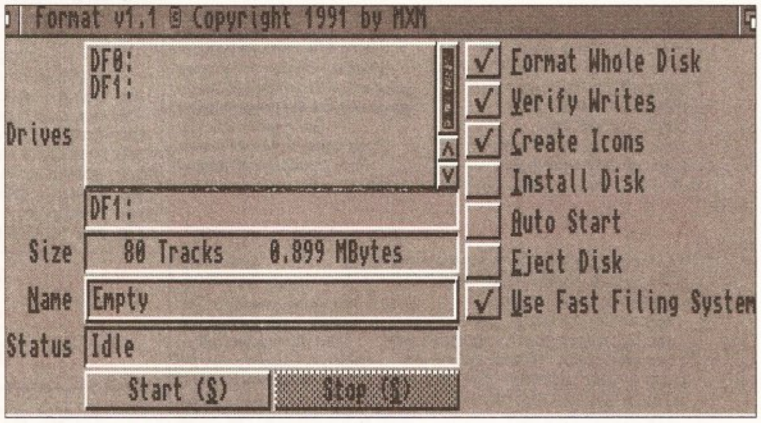
Still, beggars can't be choosers, and *Filesearch* does perform a function which is sorely missing from the Amiga.

Program rating 6/10

FORMAT

Fish disk 535

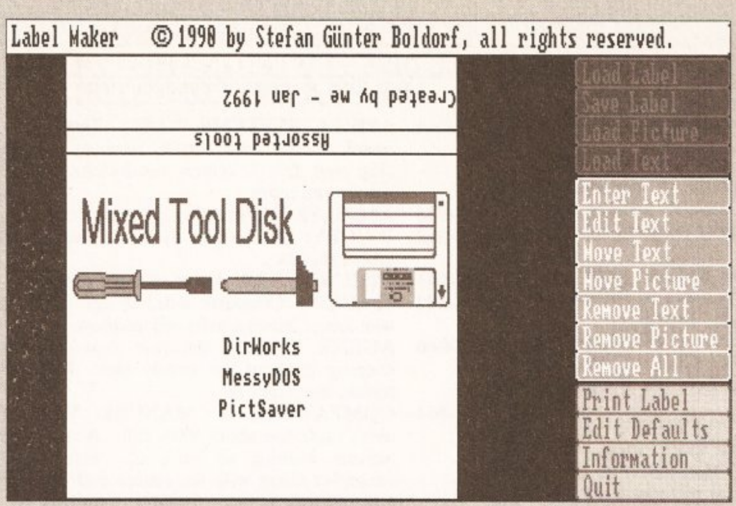
Format 1.1 is a public domain utility written by Olaf 'Olsen' Barthel to replace the standard Workbench 2.x 'format' command.



For those not happy with the Shell, this replacement for Commodore's 'format" command enables you to do everything from the Workbench. *Format* produces a requester which lists all mounted devices with handy check boxes

In the (extremely sparse) documentation he treats it as almost not worth talking about, but in fact it will be extremely useful to those Amiga users who aren't really too happy just typing 'format' from the Shell prompt, or for those who want access to a fully-featured disk formatting command from the Workbench (it can be accessed either way).

Running the program produces a requester which provides a list of all mounted devices, and a number of check-boxes for such



If your floppy disks are covered with crossed-out scrawl, *LabelMaker* could be the program you need to eliminate scruffy unreadable labels



Filer – yet another file management utility, but the screen layout is neat and uncluttered, making this one of the easiest to use

things as whether to use the FFS (fast filing system), whether to verify writes, whether to create icons etc.

These check-boxes can be activated either by clicking on them or just pressing a key on the keyboard corresponding to the first letter of the description. Give the disk a name (which defaults to 'empty') and you're ready to go.

Format is an extremely useful command – unless you're a die-hard CLI user, I recommend that you replace the format command on your Workbench disk working copy with this one immediately. It can even be made resident, if you so wish.

Program rating 9/10

POWERSNAP 1.1

Fish disk 542

Nico Francois' freeware *PowerSnap* utility gives Amiga users full 'copy and paste' functionality in all programs. It can be invoked from the Shell or from the Workbench, and supports a huge number of different options.

After installing the program (you

> **"Term's a giftware program by Olaf Barthel – which means if you like it you send a gift."**

can either use the installation routine supplied or just double-click on the program's icon to try it out), holding down the left [Alt] key and clicking the left mouse button will mark the position at which to start copying text. Drag the cursor to the end position and the selected text will be highlighted.

To paste, you just move the cursor to the appropriate position and either hit [Alt]-T or press [Alt] and the right mouse button. The text is then copied into place. This copying isn't always instantaneous – it depends on the amount of text you've copied and the font that the text is in – but it's far faster than even the best touch-typist could manage.

PowerSnap has numerous 'switches' which make the program perform differently; these can either be entered in the normal way following the program's name if you are running it from the Shell, or by adding tooltypes from the icon's 'Info' window if you are running it from the Workbench. These include selecting what key should be pressed in conjunction with the mouse button for copying and pasting, adding text before and after the selection is pasted, and removing all carriage return characters, so that the pasted text is run on to one line.

PowerSnap recognises all Amiga fonts, including scalable fonts in Workbench 2.0, and fully supports clipboard.device, so you'll be able to paste into programs which support that either by using *PowerSnap* or the program's own Paste command.

The program is compatible with Workbench 1.2, 1.3 and 2.0, and is highly recommended – it's another that I will be installing and using all the time.

Program rating 8/10

POWERPACKER UTILITIES

Fish disk 542

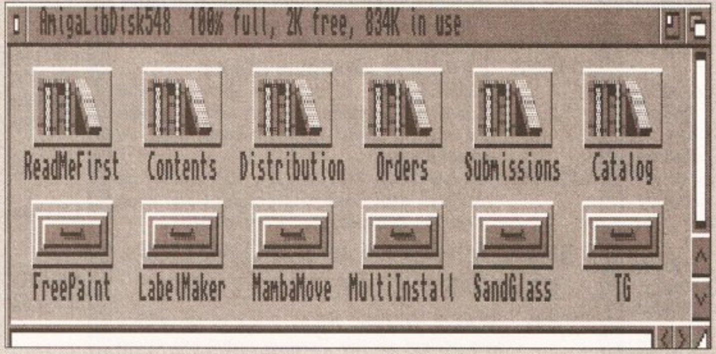
Fish disk 542 contains routines which support Nico Francois' *PowerPacker* program, which is used to crunch files. *PPMore* is the main program – it allows you to read ASCII files and files which have been crunched with *PowerPacker*.

Running it (from Shell or Workbench) produces a requester

continued on page 161

Who on earth is Fred Fish?

Fred Fish is an American who seems to spend all of his time collecting Amiga PD and shareware. Since its beginnings in 1985, the Fred Fish collection, as it's known, has grown to 580 or so disks of programs and utilities – that is, there were 580 disks available when this column was put together; by the time you read it there will doubtless be 20 or 30 more. Indeed, as the Amiga becomes more and more popular, so the rate of production of Fish disks increases.



If you've got a Fred Fish disk in your collection you'll be able to recognise it immediately because all these disks have a standard appearance

Since disk 421, Fish disks have been created on an Amiga running Workbench 2.0, and indeed many of the new programs being distributed now require Workbench 2.0 to run. Of course that doesn't leave Workbench 1.3 owners out in the cold, though – many of the programs on the disks will still run on older machines. However, since machines sold in the States have been supplied with Workbench 2.0 for some time, and since Commodore has now dropped the A500 in favour of the A500 Plus, it is a fact of life that more and more programs will require the new operating system in the future. You should find that, wherever possible, I've noted whether the program will work with Workbench 1.3 machines. They have all been tested on an A500 Plus, running Workbench 2.04.

Unlike some PD distributors, Fred makes sure that his disks have a consistent look to them, so you don't have to waste time working out how to read the doc files or whatever. There is a standard line of icons containing information such as the contents of the disk, where to contact Fred and so on, and all documentation is set up to use the *MuchMore* text reader, which is included on each disk. The disks don't self-boot – you need to load Workbench to access them – but they include utilities like *LHarc* if it's necessary to use a program, so they're fairly self-contained.

continued from page 159

which provides a directory listing from which you can select the file to read. A program that every user should have.

The other utilities extend the usefulness of *PowerPacker* (which is available as shareware up to version 2.3b, or as a commercial program from version 3.0 upwards). For example, *PowerPacker Patcher* makes *PowerPacker* files act as if they were 'normal'. For instance, if you crunched all your .info files with *PowerPacker* you would save space on your disk, but the icons would act perfectly normally.

PowerPacker Patcher also lets other programs like text editors and IFF file viewers access crunched files directly. *PowerPacker LoadSeg* does the same with fonts, libraries and devices (note that an update to this program is on Fish disk 569).

The *PowerPacker* utilities are well worth having, although it's rather a shame that the disk doesn't contain *PowerPacker* itself.

Programs' rating 7/10

LABELMAKER 1.5

Fish disk 548

This freeware program, by Stefan G Boldorf, allows you to create and print 3.5" disk labels using any printer supported by Preferences. It works with Workbench 1.2, 1.3 or 2.x and will even output coloured labels if your printer can cope with colour.

Graphics (in IFF format) can be imported, as can text (although the formatting commands which you'll have to add to a text file mean that it is easier to re-type the text directly into the program). Text and images can be moved around, text font can be changed and the words coloured.

However, this program isn't going to be the answer to a PD library's prayers – it takes too long to create each disk to be usable by a commercial organisation.

All things considered, *Labelmaker* creates nice, neat disk labels and should certainly smarten up the appearance of the average software collection. What better way to be neat and tidy?

Program rating 6/10

JARGON BUSTING • JARGON BUSTING

File compression – This is a procedure whereby files are reduced in size, thus allowing more to be packed on a disk. To make the files usable, you must have a decompression utility – there are several around, with names like L*Harc*, *Zoo* and so on. The Chris Hames disk covered in the 'Every home should have one' box on page 162 contains a number of such utilities.

SID – *SID* is a file management program which has become incredibly popular due to its ease of use. It allows users to do things like display full directories of disks, copy files, rename them and so on without having to resort to the Shell or without having to cope with icon-filled screens.

TOOLSDEAMON 1.0

Fish disk 561

This freeware utility, written by the ubiquitous Nico Francois, allows you to run programs by selecting an item from the Tools menu of Workbench 2.0.

Installation is a simple matter of running an installation program and copying a file into the WBStartup drawer of your startup disk. Then running the *ToolsPrefs* program allows you to define menu items and decide what Shell or Workbench commands should be executed when you select that item. But since this is not a particularly intuitive process for many, Nico has improved the interface by allowing the user to just drop a Workbench icon on to the running *ToolsPrefs* window. This will create a menu item named after the icon, and will generate a list of commands needed to run the program. This is a superb way of working, and means that absolutely anyone can use the program (although the instructions could have been a little clearer).

ToolsDeamon is certain to find a place on my hard disk – now, instead of ferreting through a million drawers to get to my wordprocessor, comms program and the like I can just select their names from my Workbench Tools menu. Thanks, Nico!

Oh, and in case you're wondering, the word 'deamon' (or more often daemon) comes from the Unix world, where small programs which sit in the background and look after system housekeeping tasks are known as daemons. Just thought you'd like to know...

Program rating 8/10

The range of PD software is becoming increasingly bewildering. That's where Public Domain World comes in, helping you to make your choice between the good, the bad and the ugly.

FILER

Fish disk 562

This is a shareware program by Matthias Scheler. It is similar in some ways to *SID*, although to my mind it's a little clearer and easy to use. It has a very 'Workbench 2.0' look – indeed, it requires Kickstart 2.0 to run. Configuration is either via a menu for simpler options, or via a text file which can be edited using whichever text editor you prefer.

Filer has a built-in text viewer, sound player and IFF viewer, but the text viewer can be overridden, so that selecting the 'Type' button launches *PPMore*, *MuchMore* or whatever, and the 'Edit' button can be set to launch your preferred editor. The program can be set to launch de-archiving programs (if you have them, that is) when the 'Extract' button is pressed.

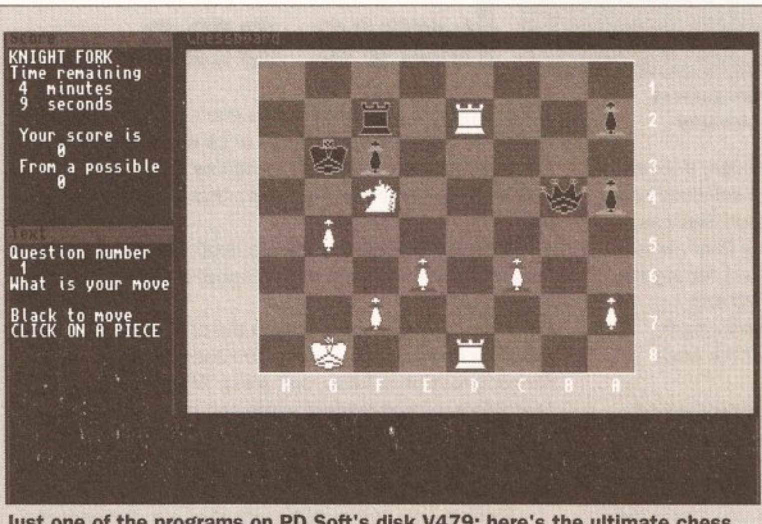
Filer has a two-directory buffer built-in (although it can be disabled if required), so changing between a sub-directory and its parent is faster than in many such programs. It also supports hardlink and softlink.

The program is shareware, and some of the features of the demo version are disabled (although very few). The registration fee is $20.

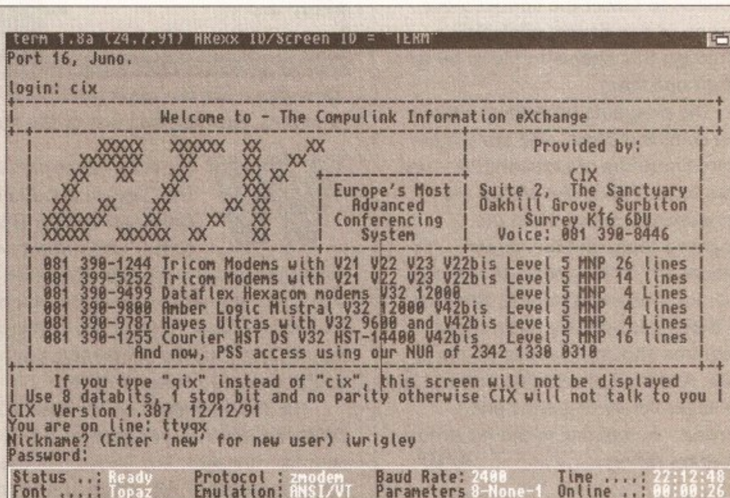
My only real complaint with *Filer* is that the instructions are formatted to be read by some *TeX* variant or other, which means that anyone viewing them with a normal text reader like *More* or *Filer*'s own built-in viewer has to plough through loads of formatting information to get to the actual text.

Complaints aside, though, I would recommend that anyone who feels, as I do, slightly unhappy about using *SID* (I don't know, I've just never felt too keen on it) should check *Filer* out right now.

Program rating 8/10



Just one of the programs on PD Soft's disk V479: here's the ultimate chess challenge, solve the puzzles within a given time limit



Term **(see page 162) is an excellent 'giftware' comms package – it's almost worth upgrading to Workbench/Kickstart 2.x just for this!**

CHESS PROGRAMS AND UTILITIES

PD Soft disk 479

This disk contains a selection of programs by Australian international chess player Bill Jordan. The programs are freeware, but are only demonstration versions – the library of games, puzzles and so on is only limited. The full versions of the programs are available by sending payment to Bill in Australia.

There isn't actually a chess program on the disk; instead there are programs with numerous 'white to move, mate in two'-type puzzles for you to solve. You can, if you want, have a time limit within which you must make your decision. There is also a program which plays back some major games, with you required to select the correct move for one of the players each time (although this seems to me to be a rather odd idea).

"If you've got a modem and an Amiga, get yourself a copy of Term and be prepared to junk whatever you're using."

The programs have been written in a compiled Basic, and are a little limited in terms of presentation – you have to wait while the pieces are painstakingly drawn when the programs load, and the screen colours are nothing short of hideous. Still, for those who want to bone up on their chess-playing skills these programs should have something to offer. And the full versions promise a far larger library of games and puzzles – numbering in the hundreds.

Program rating 5/10

TERM 1.8A

Fish disk 534

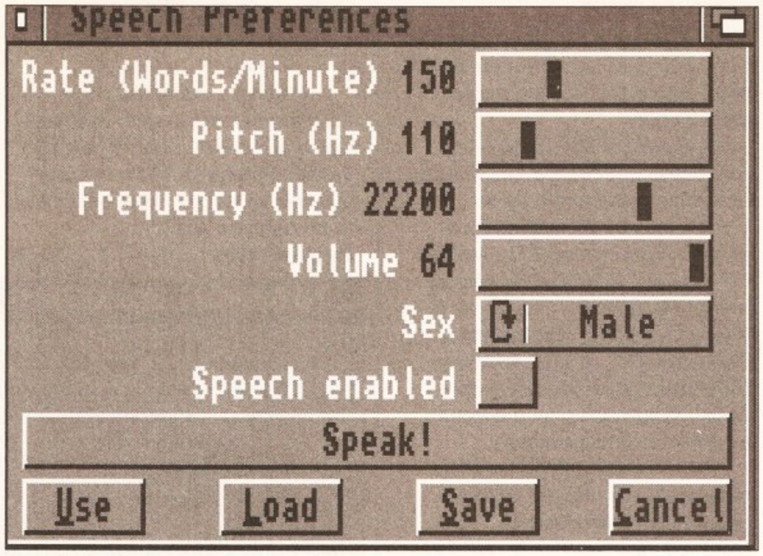
Term is a 'giftware' program by Olaf Barthel – if you like it, he asks that you send him a gift. The program takes up the whole of Fish disk 534 and is, quite simply, the best shareware comms program that I've seen for the Amiga – it beats *NComm* into a cocked hat.

It's also the first written specifically for Workbench 2.x users – you must have Kickstart and Workbench 2.0 or above for it to work. And boy, does it work! I could go on all day listing its features; for instance, it supports ARexx, can be configured to use any Amiga screen mode, can have up to 40 macros defined, has an option for a spoken narration of what's going on... and much more.

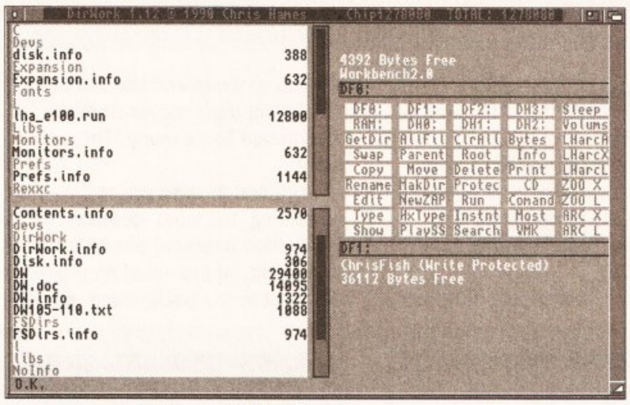
The program takes an interesting approach to file transfer: instead of having its transfer modes built-in, it comes with a number of 'xpr libraries' which must be installed in the libs: directory of the startup disk. This means that owners of floppy disk-only systems will have to create a cut-down Workbench disk so that there is room for the libraries to be installed: it's a bit of a tight squeeze, but it can be done.

The libraries are installed just by double-clicking on an icon – there's no need to manually copy them across. Libraries supplied included those for the x-modem, z-modem and Kermit protocols, which should cover any eventuality. However, the beauty of the system is that if

continued on page 163



Ian's favourite this month – *Term* has got an endless list of features; it even enables you to have a spoken commentary



***Dirworks* – not the most intuitive file management program, but certainly one of the most powerful**

Every home should have one

Well, every home with an Amiga, anyway. The 'one' in question is a self-booting disk from George Thompson Services, called 'Chris Hames Utility Disk', which contains a great collection of utilities perfect for anyone who's just starting in the world of Amiga PD and shareware. None of them are particularly exciting in themselves, but the combination is one of the most useful I've seen in some time.

The main program on the disk is something called *DirWorks*, which is yet another *SID*-alike disk organiser cum file manager. The version on the disk is 1.12, which isn't the latest (1.43, which can be found on Fish disk 570), but its real saving grace is that it's tiny – only 29K, in fact. It is much less intuitive to use than *SID*, but its size and extra power makes up for this. Built in to *DirWork* are buttons which do things like de-ARC and de-*ZOO* files automatically. And this brings us to the other utilities on the disk. The buttons in *DirWorks* call the de-archiving utilities which are in the c: directory of the disk – so owners of two-floppy systems can boot from the Chris Hames disk, put their archived disk in df1: and de-archive the files with no disk swapping necessary.

All the buttons in DirWorks are, in fact, completely customisable – full instructions are included on how to do it – and that's what makes the program so powerful.

Other programs on the disk include:

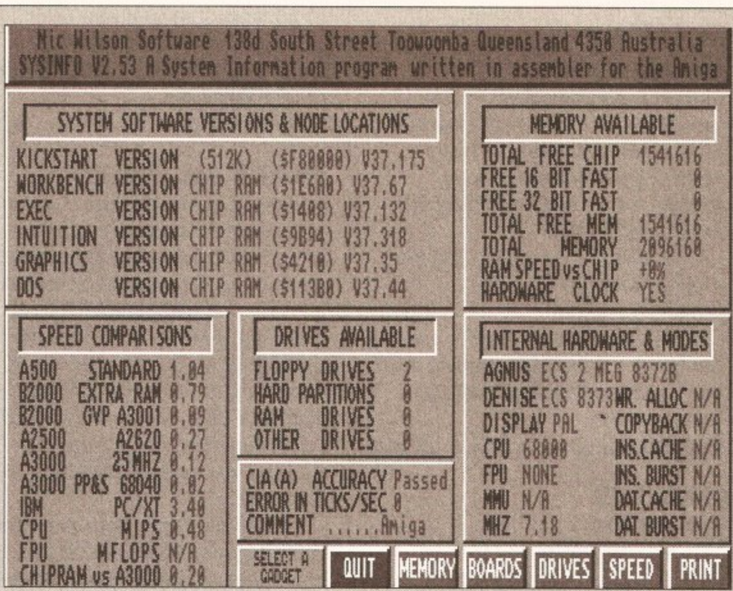
- *Fast Smooth Dirs 1.3*: This utility patches into the Amiga's operating system and speeds up disk access. It also reduces the amount of grinding noise produced by the disk drive, since it cuts down jumps between tracks. Definitely worth installing in your startup-sequence.
- *VirusMemKill 27*: Actually, this one's only of use to owners of older Amigas – those of us with Kickstart 2.0 can't use it, since it doesn't recognise the new operating system and immediately assumes that there's a virus in place.
- *NoInfo*: A program which stops applications creating .info files every time you save a document.

There are also numerous files in the c: directory, including *PowerPacker*, *LHarc*, *Zoo* and *Arc*, which are all file compression utilities, and *Most*, *PPMore* and *MuchMore*, all text-readers which can be used as a replacement for the standard *More* reader. Few of the utilities are the most up-to-date versions (although they are updated from time to time), but they all work fine.

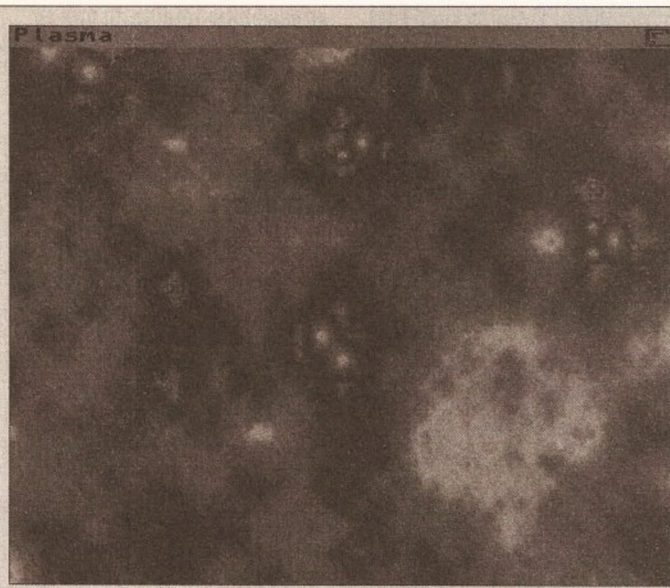
There is only one problem with the disk: the version we were supplied with had *DirWorks* configured so that it automatically checks for viruses in memory. While this is no problem for Kickstart 1.3 users, those of us with Kickstart 2.0 find that as soon as the program is loaded an orange screen appears, which warns of a possible (but non-existant) virus. Fortunately, this can be easily overcome: click the right mouse button a few times until the program's main screen appears, then go immediately to the menu and un-check the 'Periodic Virus Memory Check' option. Then save this newly-configured DW on top of the old one.

Hopefully, by the time you read this the disk will have been altered so that either a newer version of DirWorks is included, or at least the one present doesn't default to checking memory.

That minor gripe aside, the Chris Hames Utility Disk is a very useful collection of utilities that every Amiga should have, and is well worth purchasing.



According to *Sysinfo*, my Amiga is running exactly 1.04 times faster than a standard A500!



There had to be one didn't there – a fractal design that is! *Plasma* draws fast, attractive fractals

someone invents a new, faster transfer protocol, the main program doesn't have to be updated. Instead, all that is needed is a new library to be written. And the libraries are, of course, available to any other program which can use them.

The program has so many different preferences screens it's incredible: virtually anything can be configured, from the emulation mode through the screen mode to whether to have voice commentary or not. All the preferences are set via gadgets in windows, and the whole thing gives the impression of having been really well thought out.

Term is this month's favourite program for me: if you've got a modem and an Amiga with Kickstart 2.x, get yourself a copy of this program and be prepared to junk whatever you're currently using.

Program rating 10/10

QUICKIES

AWP

Fish disk 544

AWP stands for Animate Workbench Pointer, and is a program to do just that – it animates the hands on the Workbench 2.0 'busy' clock, revolving both the minute and hour hands at a user-definable speed. It's only invokable from the Shell, but it's worth putting on your startup disk just to amuse other Amiga owners! After all, it's only about 1.5K long.

Note that this program requires Workbench 2.x; if you have 1.3, SandGlass, by Dirk Remmelt, is on Fish disk 548 and will do a similar thing to the Workbench 1.3 'busy' pointer for you.

Program rating ....Er...

PICTSAVER 2.0

Fish disk 543

This is a program which won't be useful to everyone, but people like me, who need to grab screens from Amiga programs and save them as IFF files will find it invaluable. Written by Preben Nielsen, it is installed by typing its name from the Shell or by double-clicking on its icon in the Workbench. After the program is installed, grabbing screens is simply a matter of holding down [Ctrl][Alt]-a: the screen is then saved with a name which can be determined by holding down [Ctrl][Alt][Help].

Sequential numbering of saved screens is supported, as is file compression.

Not only whole screens need be saved, though – you can save individual windows or select a specific rectangle of screen to save just by hitting the correct key combination. And you can choose to only save certain bitplanes to disk, too.

All in all, a very useful program – if only to a fairly small number of people.

Program rating 8/10

RMBSHIFT

Fish disk 547

This tiny program by Preben Nielsen takes only 174 bytes of memory when it's running. Its task is to allow multiple selection of icons without using the [Shift] key on the keyboard. Instead, the right mouse button performs as a Shift key.

If you have a three-button mouse, *MMBShift* on the same disk will let you use the middle mouse button instead of the Shift key.

RMBShift is one of those tiny utilities which you soon find you're using all the time. Just add it to your startup-sequence and see how you

Programs reviewed this issue

Chris Hames Utility Disk — George Thompson Services
A neat collection of utilities that every Amiga owner should have.

Filesearch — Fish disk 531
At last, a utility for finding files buried deep in your hard disk.

Term — Fish disk 534
A Workbench 2.x-only comms program that beats the opposition hands-down.

Format — Fish disk 535
A replacement for Commodore's disk formatting utility.

PowerSnap — Fish disk 542
Enables copying and pasting text in any application.

PowerPacker utilities — Fish disk 542
A suite of routines to maximise the power of *PowerPacker*.

PictSaver — Fish disk 543
A routine for grabbing portions of screens and saving as IFF files.

AWP — Fish disk 544
Makes the hands on the Workbench 2.0 'busy' clock revolve.

RMBShift — Fish disk 547
Allows you to use the right mouse button as a Shift key when selecting icons.

LabelMaker — Fish disk 548
A disk label creation tool.

Tools Deamon — Fish disk 561
Allows you to launch programs by selecting them from the Tools menu in Workbench 2.0.

Filer — Fish disk 562
A file management utility à la *SID*.

Sysinfo — Fish disk 571
Find out those vital details about your Amiga.

Plasma — Fish disk 573
An extremely fast fractal drawing program.

Chess programs and utils — PD Soft disk V479
Brush up on your chess with these tutorial programs.

PD PAYMENT

Is PD for free? Well PD is, but disks, postage and the wages of the men who sit at the machines all day aren't – so be prepared to pay from 99p to £2.50 per disk, although price can vary depending on where disks are bought and from whom. It may depend on how the disks are copied. Obviously if there's an office and a duping machine, then it costs money to run. In any case the only way to find out if it's good value is to spend the cash or read *Amiga Shopper*, of course.

struggle when you try to use an Amiga that doesn't have it installed!

Program rating 8/10

SYSINFO 2.53

Fish disk 571

I don't know why, but this program is incredibly popular with large numbers of Amiga users – especially the more teccy ones.

If you're interested in finding out how your Amiga's speed compares to another member of the Amiga family or to an IBM PC, or if you've a deep desire to know what memory address all your RAM resides at, this one's for you.

The program is also useful to refer to if you're sending in a query to *Amiga Shopper* – it will tell you virtually everything you need to know to fill in the Amiga Answers form.

Program rating 7/10

PLASMA

Fish disk 573

Those of you who collect fractal generating programs might like to take a look at *Plasma*, by Roger Uzun. It creates plasma cloud fractals, which exhibit very smooth colour graduations.

Colours can be cycled, and the program draws the fractals remarkably quickly.

Hint: to quit the program, use [Amiga]-Q – the documentation, such as it is, doesn't bother telling you that.

Program rating 6/10

MKSLENS

Fish disk 574

This program, written by Michael Sinz, produces a window which displays a magnified view of the area around the cursor. The magnification is adjustable from 1 to 16 times. Useful if your paint package doesn't provide a magnification facility – rather a waste of time otherwise.

Program rating 5/10

THAT'S ALL, FOLKS

And that just about wraps it up for this month. If you've come across any good PD that you'd like reviewing (serious stuff, though – not demos or games), or if you just want to drop me a line, you can contact me by writing c/o *Amiga Shopper*, Future Publishing, 30 Monmouth Street, Bath BA1 2BW. On the other hand you can contact me by e-mail as 'iwrigley' on cix or 100016,320 on CompuServe.

Next time I'll be looking at what you can get in the way of PD and shareware wordprocessors, as well as presenting the usual round-up of all that's best in the world of freely distributable software. AS

UK PD HOUSES

Amiga Mouse PD
182a High Street
Margate, Kent
☎ 0843 228166

Amiganuts United
169 Dale Valley Road
Hollybrook
Southampton
SQ1 6QX

Akore Shareware
7 Fishergate Point
Lwr Parliament Street
Nottingham NG1 1GD
☎ 0800 252221

AMOS PD Library (also Deja Vu)
25 Park Road
Wigan WN6 7AA
☎ 0942 495261

Anglia PDL
115 Ranelagh
Felixtowe
Suffolk IP11 7HU
☎ 0394 283494

Blitterchips
Cliffe House
Primrose Street
Keighley BD21 4NN
☎ 0535 667469

CanDo PD Library
128 Portland Crescent
Stanmore
Middlesex
HA7 1NA
☎ 081-204 3954

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PO Box 7
Bletchley
Milton Keynes
MK2 3YL
☎ 0908 640763

Crazy Joe's
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Rotherham
South Yorks S65 1BL
☎ 0709 829286

EdLib
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Brislington
Bristol BS4 5LU
☎ 0272 723489

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Suffolk NR33 0OG
☎ 0502 566752

EMPDL
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Nottingham NG15 7LE
☎ 0602 630071

Essex Computer Systems
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Basildon
Essex SS16 4JA
☎ 0268 553963

George Thompson Services
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Essendon
Herts AL9 6JB
☎ 0707 664 654

Goldstar Computers
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Tyldesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO BOX 1309
London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road
Newquay, Cornwall

Lazerdisk
57 Adamthwaite Drive
Blythe Bridge
Stoke On Trent ST11 9HL

NBS
1 Chain Lane, Newport
Isle Of Wight PO30 5QA
☎ 0983 529594

Office Choice (OC-PD)
Suite 14 Avon House,
Town Centre Cumbernauld G67
☎ 0236 737901

PD Soft
1 Bryant Avenue
Southend-On-Sea
Essex SS1 2YD
☎ 0702 612259

Public Dominator
PO BOX 801
Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst
Reading
Berkshire RG3 5AN
☎ 0734 452416

Scanner Disk Magazine
Telescan Computer Services
Handsworth Road
Blackpool FY5 1SB
☎ 0253 22296

Sector 16
160 Hollow Way
Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO BOX 97
Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Software Express
Hebron House, Sion Road
Bedminster
Bristol BS3 3BD
☎ 0272 637634

Softville
Unit 5, Stratfield Park
Elettra Avenue,
Waterlooville
Hants
PO7 7XN
☎ 0705 266509

Start Computer Systems
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Bonnersfield
Sunderland SR6 0AA
☎ 091 564 1400

Unique Computers
114 Salters Road
Gosforth
Newcastle on Tyne NE3 3UP
☎ 091-284 7976

Vally PD
PO BOX 15, Peterlee
Co Durham SR8 1NZ
☎ 091-587 1195

Virus Free PD
23 Elborough Road
Moredon, Swindon
Wilts SN2 2LS
☎ 0793 512321

Workbench PD
1 Buccluech Street
Barrow-In-Furness
Cumbria LA14 1SR
☎ 0229 870000

HyperQuick

28 Forrest Rd., Penarth, South Glam. CF6 2DP

UTILITIES

102 **DCopy - *Superb disk copier***
110 **Ncomm V1.921 - *Your modem's dream.***
111 JRComm V1.02 - *Ncomm alternative.*
120 DPaint Fonts (4)
133 Iconmakers - *Four icon making progs*
141 C-Light* - *Ray tracer*
156 Intromaker - *Design your own.*
159 Superworkbench - *WB replacement*
162 **Sid V1.06 - *Excellent dir. util***
187 MessyDos - *For the PC*
190 **NorthC V1.3 (2) - *C Compiler***
192 **C Tutorials (4) - *Learn C***
01 NoisePlayer V3 - *Play modules*
04 Soundtracker V4 (2) - *Good as Med?*
07 Future Composer - *Music Creator*
08 Star Trekker Music Prog. V1.2
10 **Med V3.11* - *Excellent music maker***
11 Sound Applications (2) - *Lots and*
23 QED text Editor - *Good*
25 **UEdit V2.6 - *Superb text editor***
28 **Analyticalc V25-03b - *Spreadsheet***
29 Spread - *Simple spreadsheet*
30 **Textplus V3.0EN - *Wordprocessor***
37 **Bit Tech Tools #1 - *203 utils!!!***
51 **PowerPacker V2.3 - *Prog. Cruncher***
52 **Imploder V4 - *Good cruncher***
01 A-Gene V3.12* - *Family trees*
03 **Anti-Virus Tool Kit**

GAMES

Monopoly - *Guess what?*
Strategy Games - *Five good games*
Truckin On (2) * - *2 Player*
Mech Flight - *Excellent*
0 Castle of Doom - *Graphic Adv.*
1 **Holy Grail Adv* - *Huge Text Adv.***
3 Breakout Con. Set - *Addictive*
0 **Dragon Cave - *Beautiful fantasy.***
4 Space Blitz - *4 Old classics*
7 **Return to Earth - *Like Elite***
9 **Pipeline - *Frustrating!!!***
5 Star Trek - *Final Frontier (2)*
6 Zeus - *Logie Teasers*
8 **Megaball* - *Superb Breakout clone***
9 **Seven Tiles - *Like Speedball***
0 **Frantic Freddie - *Platform.***
2 Master of the Town - *Be a vandal!*
3 Eternal Rome - *Strategy game.*
4 **Llamatron - *Minter Classic***
9 Mind Games - Test your IQ

FRED FISH 290 - 560
TBAG 1 - 59

DEMOS

607 **System Violation Demo - *Superb***
608 Fractal Flight Demo
610 Crionics: Total Destruction
616 **Purple - *One of the best***
618 Vortex Megademo - Quite good
620 **Red Sector Cebit Demo - *Suuberb!***
621 Pussy Innership
630 Ecstasy Demos* - Ten great demos
633 **RAF Megademo (2) - *Classic***
636 **Maximum Overdrive (2) - *THE BEST?***
637 Coma demo - Pop video
638 Total Confusion* - Very good
640 **Red Sector Megademo (2)**
644 **Silents: Blues House (2)***
645 Simpsons Demo - Decay*
646 Drifters' Demo - Six of One

ANIMATIONS

650 **Iraq Demo - *Very Funny***
652 Gymnast Animation* - *Classic*
654 Basketball Demo*
655 **Puggs in Space - *Best anim around***
657 Tron Animation (2)* - *Very long*
658 **Franklin the Fly - *Long & funny***
659 Mars Demo - *Smooth animation*
660 **Juggette & Juggette the Revenge II***
661 Juggler Demo II
663 **Fillet the Fish - *V. Funny***
665 Steve Anims (5) - *31 anims!!!*
670 Batman Demo* - *Schwartz*
671 **Revenge Horror Show - Sick**
672 **Gulf Conflict (2 meg reqd.)**
673 Pogo Anim (1.5 meg reqd) - Schwartz
674 Amy vs. Walker* - Schwartz
675 **The Education of Cool Cougar***
676 Shuttle Cock Anim* - Schwartz

MUSIC

411 **Crusaders: Bacteria - *Excellent***
415 Bomb the Bass - *Not Bad*
418 Depeche Mode - *8 D.M. tracks*
438 Cave: Synthetic Power - *10 tunes*
439 Crusaders: Sheet Music - *7 tunes*
440 J.M.Jarre - Definitive
441 **Taipan Music Demo (2) - *Brilliant***
445 Power of Love - Huey Lewis (2)
446 **In a Silent Way - *11 tunes***
447 Crusaders does Genesis
451 **Art of Med - *very long Med tunes***
453 Reincarnation of Sgt. Pepper (2)*
454 Vivaldi: The Four Seasons (2)

Key

* denotes 1 megabyte required.
(x) Figure in brackets denotes the No. of disks in set.

Charges

1 Disk	£1.50
2+ Disks each	£1.00
Cat. Disk	£0.50
UK Postage	FREE
Europe Postage	FREE

Please make payments payable to HyperQuick

95p Per disk

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Cleveland
TS26 0TE
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THE FIRST PD LIBRARY TO GIVE AWAY FREE PD!

UTILITIES

DISK LABEL DESIGNER
RSI DEMOMAKER*
RSI FONT EDITOR
RSI BOB EDITOR
RSI VECTOR EDITOR
PACMAN COPIER
HOT UTILS!
BIT TECH TOOLS #1 (200+)!
SPECTRUM EMULATOR
SPECTRUM DATADISK1
AMATEUR RADIO DISK
M.R. BACKUP (HD BACKUP)
SPRITE MASTER + IMAGE ED
T.V. GRAPHICS II (2)
CLERK ACCOUNTS
STOS TO AMOS
BOOTBLOCK UTILS (2)
CROSSDOSS V4.02A
XWORD CREATOR
A. GENE V3.125*
AMIBASE V3.76
MESSYSID
CHEQUE BOOK PROGRAM
HOME APPLICATIONS (2)
MEGAPACKER
ICON MAGIC
JAZZBENCH
STARCHART
FORTH PROGRAMMING DISK
KING JAMES BIBLE (4)
TETRA COPIER
SPEEDBENCH
PENNYWISE ACCOUNTS
MEGA FONT (2)
DRAW MAP
GRAPHICS INTERCHANGE
CELTIC DEMO CREATOR
HEADLINE FONTS
GHOSTWRITER*
HOUSEHOLD INVENTORY
FIX DISK
SCROLL TEXT EDITOR
FLETCHER FONT UTILS (2)
AMIGA VENTURE CREATOR

DEMOS

FRANCE BY SILENTS
VIC REEVES DEMO (2)
ALCATRAZ MEGADEMO III
THUNDERBIRDS MEGADEMO
RAF MEGADEMO (2)
PHENOMENA ENIGMA*
VIRTUAL WORLDS*
PSEUDO OPS MEGADEMO
CRIONICS NEVERWHERE
KGB MEGADEMO (2)
THE WALL (6) 2 DRIVES
GLOBAL TRASH BY SILENTS
VISION MEGADEMO
DARKNESS MEGADEMO II
FRAXION REVENGE
KEFRENS MEGADEMO VII (2)
BUDBRAIN MEGADEMO (2)
BUDBRAIN MEGADEMO II
PREDATORS MEGADEMO (2)
ELVIRA
SILENTS MEGADEMO

GAMES

MASTER OF THE TOWN
ATIC ATAC
PAC MAN
BATTLE PONG
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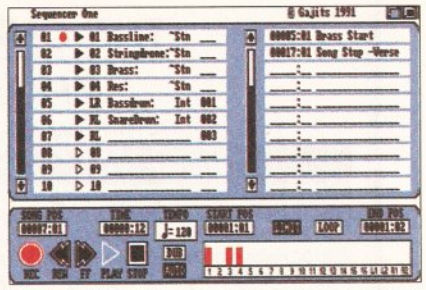
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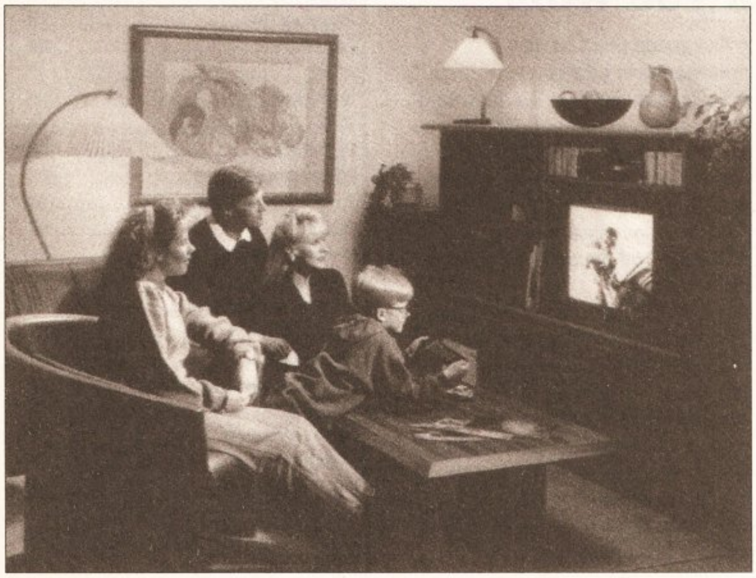
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Win a CDTV and join the info revolution!



Conjure yourself a magical CDTV from those wonderful Merlin people by answering our three easy questions



Multi-media is certainly the happening thing at the moment, and now *Amiga Shopper* along with Merlin Express are offering you the chance to beat the Joneses and be the very first in your street to get in on the act. Yes, that's right, you could be the proud owner of one of Commodore's Amiga CDTVs (formerly CDTV)!

CDTV, for those of you who don't know already, stands for Commodore Dynamic Total Vision, and it's the company's attempt to bring multi-media into every home.

But what, you may ask, do we mean by 'multi-media'? By 'multi-media' we mean lots of whizzo pictures, animations, sounds, speech and text all in the same application. Imagine an encyclopedia that can talk and show clips of film. Imagine being able to cross reference a vast store of information at the click of an infra-red remote control hand set. Imagine having a CD with 650Mb (that's more than 750 ordinary floppies) of information on a single subject.

We are moving into an era of history in which information will be the most valuable commodity. CDTV gives the home user easy access to this information, and all through an attractive user interface.

Obviously CDTV is invaluable for reference, but its possibilities for education are truly awesome. Check out Mark Smiddy's article on page 15 for details of the stunning packages already available. As Mark concluded, "I have seen the future of education: its name is Commodore Dynamic Total Vision."

So if you'd like the chance to try out one of these amazing machines for yourself, then all you have to do is have a go at the questions below. Jot down your answers on a postcard or the back of a sealed envelope and send them to us at:
CDTV Competition
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL
The closing date is 10 April.

THE CHALLENGE

QUESTION 1

Whereabouts in Cornwall is Camelot believed to have been?

a) Porthcurno
b) Polperro
c) Tintagel

QUESTION 2

What was the name of King Arthur's court magician?

a) Paul Daniels
b) Merlin
c) Faust

QUESTION 3

Who was King Arthur's wife?

a) Gwendolin
b) Guinevere
c) Guatemala

ARE YOU ONE OF OUR WINNERS?

A couple of months back an Amiga 500 Plus was the star prize on offer from Gordon Harwood Computers. The answers to that competition way back in December go like this:

1) It was Andy Warhol who helped launch the original Amiga.
2) The Agnus chip on the Amiga 500 Plus can address 2Mb of Chip RAM.
3) HAM stands for Hold and Modify.

After much deliberation and sorting through the flood of entries – by far the biggest response yet – we have come up with a winner. It is...
LY Songyow of South Norwood, London.

TWO SHORT YEARS AGO...

A brief look at the Amiga's shady past...

- The popular PD disk, *The Amiga C Manual*, was released by Anders Bjerin and came to the rescue of many would-be programmers.
- An Amiga-based system was launched for training air traffic controllers. It featured a 68020 processor running AmigaDOS and a graphics card giving a resolution of 1,280 x 1,024 pixels on a touch sensitive screen.
- Commodore launched the *Flight Of Fantasy* bundle.
- The stunning Mandala virtual reality system, based around the Amiga, made its first apppearance.

...AND NEXT MONTH

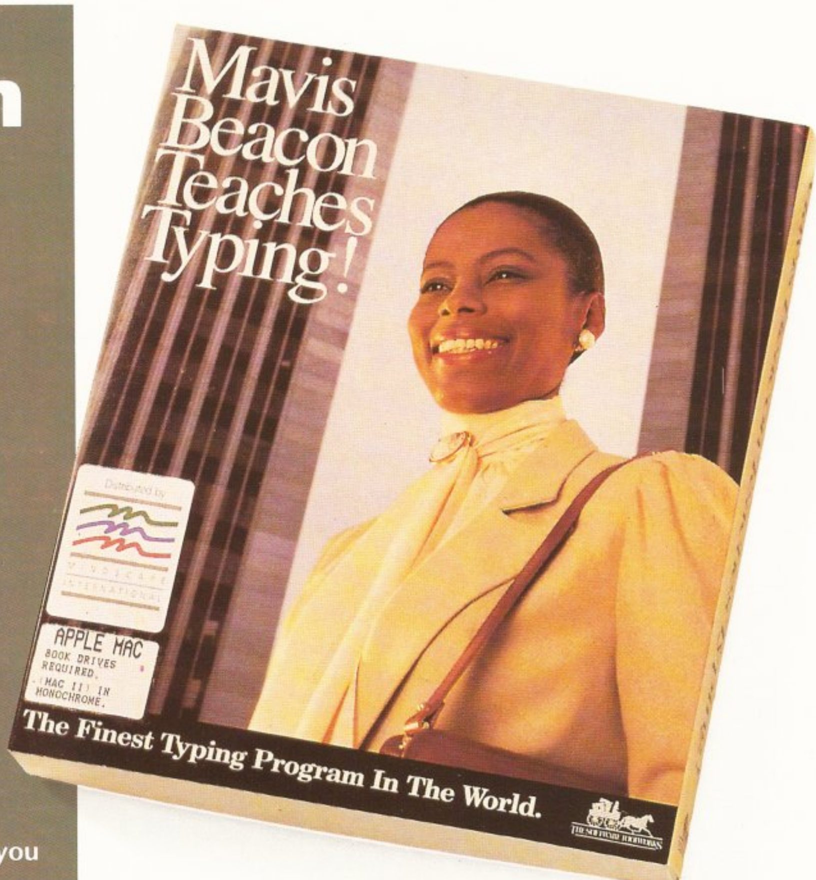
But seriously folks, what you really want to know is when the next *Amiga Shoppper* hits the streets – and who can blame you?

We'll be back on 5th March, and will be covering:

- Hard Drives – at last Jolyon Ralph explain's everything you ever wanted to know and weren't particularly afraid to ask.
- The amazing DCTV graphics system gets the in-depth AS treatment from Gary Whiteley *and* Jason Holborn.
- Paul Overaa takes a look at *Devpac 3*, the latest incarnation of HiSoft's acclaimed assembler.
- *Amiga Shopper* – buy it, you know it makes serious sense.

Mavis Beacon Teaches Typing

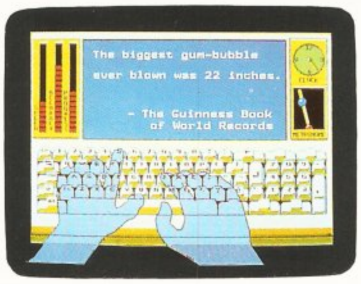
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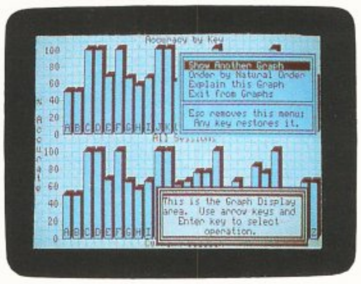
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